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SERVICE MANUAL

DVD-HR720

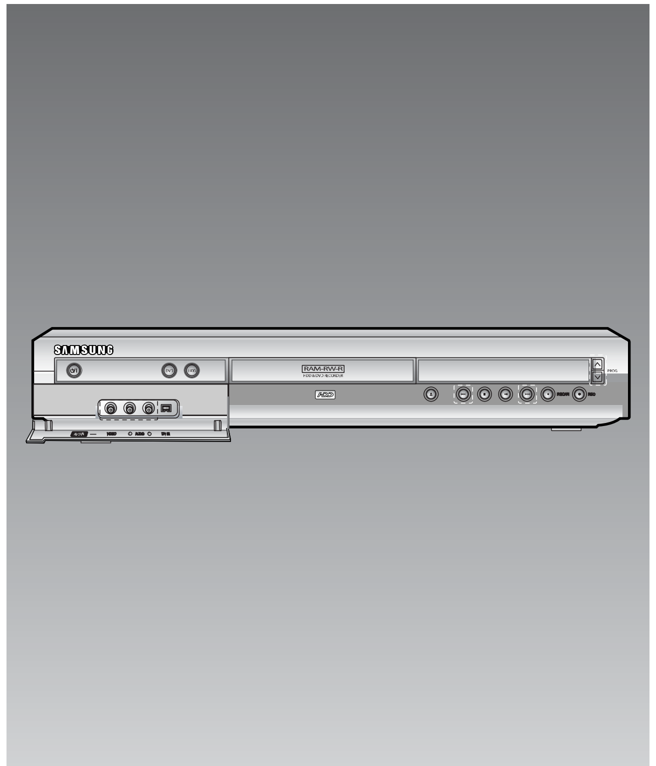
DVD- RECORDER

Chassis : K2 (2nd Generation)

DVD-HR720/XAA, XAC

SERVICE Manual

DVD-RECORDER



Main Features

1. Multi format recording
   DVD-RAM/ DVD-RW/ DVD-R
2. Multi format playback
   DVD / DVD-RAM / DVD-RW / DVD-R
   CD / CD-R / CD-RW / MP3 / JPEG
3. Recording mode(4.7G disc)
   XP(1Hour) / SP(2Hour) / LP(4Hour) /
   EP(6~8Hour)
4. Progressive scan
5. Automatic Chapter product on
6. 79mm Slim Design

When repairing this product, please exchange HDD ASSY.
Additional format or adjustment is not necessary.

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1. Precautions

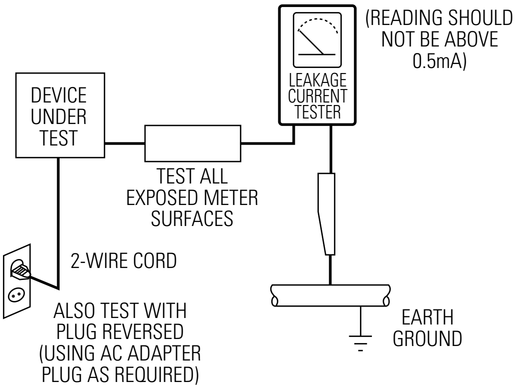
1-1 Safety Precautions

1) Before returning an instrument to the customer, always make a safety check of the entire instrument, including, but not limited to, the following items:

(1) Be sure that no built-in protective devices are defective or have been defeated during servicing. (1)Protective shields are provided to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
(2)When reinstalling the chassis and/or other assembly in the cabinet, be sure to put back in place all protective devices, including, but not limited to, nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks. Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

(2) Be sure that there are no cabinet openings through which adults or children might be able to insert their fingers and contact a hazardous voltage. Such openings include, but are not limited to, excessively wide cabinet ventilation slots, and an improperly fitted and/or incorrectly secured cabinet back cover.

(3) Leakage Current Hot Check-With the instrument completely reassembled, plug the AC line cord directly into a 120V AC outlet. (Do not use an isolation transformer during this test.) Use a leakage current tester or a metering system that complies with American National Standards institute (ANSI) C101.1 Leakage Current for Appliances and Underwriters Laboratories (UL) 1270 (40.7). With the instrument's AC switch first in the ON position and then in the OFF position, measure from a known earth ground (metal water pipe, conduit, etc.) to all exposed metal parts of the instrument (antennas, handle brackets, metal cabinets, screwheads, metallic overlays, control shafts, etc.), especially any exposed metal parts that offer an electrical return path to the chassis.
Any current measured must not exceed 0.5mA. Reverse the instrument power cord plug in the outlet and repeat the test. See Fig. 1-1.
Any measurements not within the limits specified herein indicate a potential shock hazard that must be eliminated before returning the instrument to the customer.



(READING SHOULD NOT BE ABOVE 0.5mA)
LEAKAGE CURRENT TESTER
DEVICE UNDER TEST
TEST ALL EXPOSED METER SURFACES
2-WIRE CORD
ALSO TEST WITH PLUG REVERSED (USING AC ADAPTER PLUG AS REQUIRED)
EARTH GROUND

Fig. 1-1 AC Leakage Test

(4) Insulation Resistance Test Cold Check-(1) Unplug the power supply cord and connect a jumper wire between the two prongs of the plug. (2) Turn on the power switch of the instrument. (3) Measure the resistance with an ohmmeter between the jumpered AC plug and all exposed metallic cabinet parts on the instrument, such as screwheads, antenna, control shafts, handle brackets, etc. When an exposed metallic part has a return path to the chassis, the reading should be between 1 and 5.2 megohm. When there is no return path to the chassis, the reading must be infinite. If the reading is not within the limits specified, there is the possibility of a shock hazard, and the instrument must be repaired and rechecked before it is returned to the customer. See Fig. 1-2.

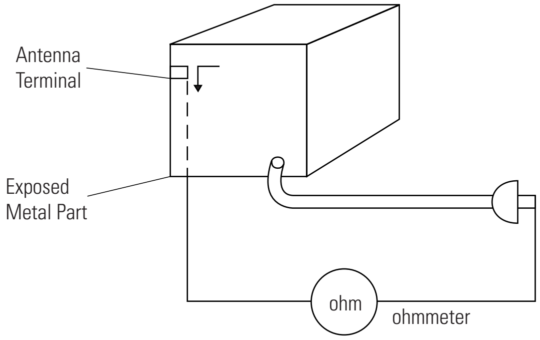


Fig. 1-2 Insulation Resistance Test

2) Read and comply with all caution and safety related notes on or inside the cabinet, or on the chassis.

3) Design Alteration Warning-Do not alter or add to the mechanical or electrical design of this instrument. Design alterations and additions, including but not limited to, circuit modifications and the addition of items such as auxiliary audio output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions will make you, the servicer, responsible for personal injury or property damage resulting therefrom.

4) Observe original lead dress. Take extra care to assure correct lead dress in the following areas:
(1) near sharp edges, (2) near thermally hot parts (be sure that leads and components do not touch thermally hot parts), (3) the AC supply, (4) high voltage, and (5) antenna wiring. Always inspect in all areas for pinched, out-of-place, or frayed wiring, Do not change spacing between a component and the printed-circuit board. Check the AC power cord for damage.

5) Components, parts, and/or wiring that appear to have overheated or that are otherwise damaged should be replaced with components, parts and/ or wiring that meet original specifications.
Additionally, determine the cause of overheating and/or damage and, if necessary, take corrective action to remove any potential safety hazard.

6) Product Safety Notice-Some electrical and mechanical parts have special safety-related characteristics which are often not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage, wattage, etc. Parts that have special safety characteristics are identified by shading, an (⚡)or a (⚠)on schematics and parts lists. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire and/or other hazards. Product safety is under review continuously and new instructions are issued whenever appropriate.

1-2 Servicing Precautions

CAUTION : Before servicing units covered by this service manual and its supplements, read and follow the Safety Precautions section of this manual.

Note : If unforseen circumstances create conflict between the following servicing precautions and any of the safety precautions, always follow the safety precautions. Remember: Safety First.

1-2-1 General Servicing Precautions

(1) a. Always unplug the instrument's AC power cord from the AC power source before (1) re-moving or reinstalling any component, circuit board, module or any other instrument assembly, (2) disconnecting any instrument electrical plug or other electrical connection, (3) connecting a test substitute in parallel with an electrolytic capacitor in the instrument.

b. Do not defeat any plug/socket B+ voltage interlocks with which instruments covered by this service manual might be equipped.

c. Do not apply AC power to this instrument and /or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.

d. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the test instrument positive lead. Always remove the test instrument ground lead last.

Note : Refer to the Safety Precautions section ground lead last.

(2) The service precautions are indicated or printed on the cabinet, chassis or components. When servicing, follow the printed or indicated service precautions and service materials.

(3) The components used in the unit have a specified flame resistance and dielectric strength.
When replacing components, use components which have the same ratings. Components identified by shading, by(⚡) or by (⚠) in the circuit diagram are important for safety or for the characteristics of the unit. Always replace them with the exact replacement components.

(4) An insulation tube or tape is sometimes used and some components are raised above the printed wiring board for safety. The internal wiring is sometimes clamped to prevent contact with heating components. Install such elements as they were.

(5) After servicing, always check that the removed screws, components, and wiring have been installed correctly and that the portion around the serviced part has not been damaged and so on. Further, check the insulation between the blades of the attachment plug and accessible conductive parts.

1-2-2 Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power ON. Connect the insulation resistance meter (500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts(see note) should be more than 1 Megohm.

Note : Accessible conductive parts include metal panels, input terminals, earphone jacks, etc.

1-3 ESD Precautions

Electrostatically Sensitive Devices (ESD)

Some semiconductor (solid state) devices can be damaged easily by static electricity.
Such components commonly are called Electrostatically Sensitive Devices(ESD). Examples of typical ESD devices are integrated circuits and some field-effect transistors and semiconductor chip components. The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

(1) Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

(2) After removing an electrical assembly equipped with ESD devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

(3) Use only a grounded-tip soldering iron to solder or unsolder ESD devices.

(4) Use only an anti-static solder removal devices. Some solder removal devices not classified as “anti-static” can generate electrical charges sufficient to damage ESD devices.

(5) Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ESD devices.

(6) Do not remove a replacement ESD device from its protective package until immediately before your are ready to install it.(Most replacement ESD devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive materials).

(7) Immediately before removing the protective materials from the leads of a replacement ESD device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

(8) Minimize bodily motions when handling unpackaged replacement ESD devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ESD device).

1-4 Handling the optical pick-up

The laser diode in the optical pick up may suffer electrostatic breakdown because of potential static electricity from clothing and your body.

The following method is recommended.

(1) Place a conductive sheet on the work bench (The black sheet used for wrapping repair parts.)

(2) Place the set on the conductive sheet so that the chassis is grounded to the sheet.

(3) Place your hands on the conductive sheet(This gives them the same ground as the sheet.)

(4) Remove the optical pick up block

(5) Perform work on top of the conductive sheet. Be careful not to let your clothes or any other static sources to touch the unit.

- ◆ Be sure to put on a wrist strap grounded to the sheet.
- ◆ Be sure to lay a conductive sheet made of copper etc. Which is grounded to the table.

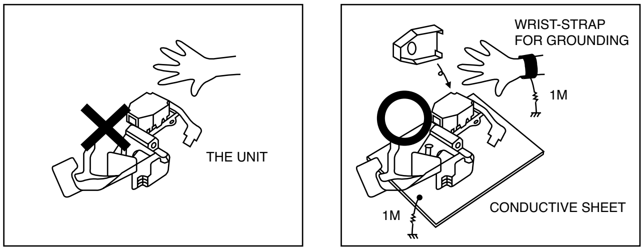


Fig.1-3

(6) Short the short terminal on the PCB, which is inside the Pick-Up ASS'Y, before replacing the Pick-Up. (The short terminal is shorted when the Pick-Up Ass'y is being lifted or moved.)

(7) After replacing the Pick-up, open the short terminal on the PCB.

MEMO

2. Product Specification

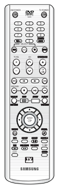
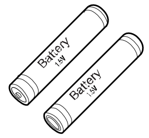
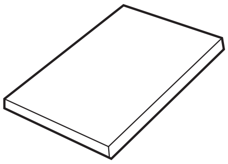
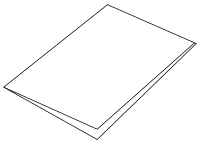
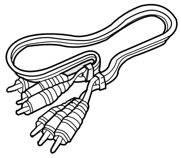
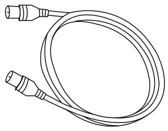
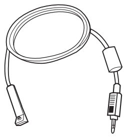
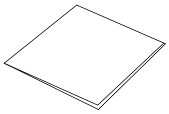
2-1 Product Specification

General	Power requirements	AC 120V ,60Hz
	Power consumption	44Watts
	Weight	9.27lb
	Dimensions	17in(W) x 9.8in(D) x 2.9in(H)
	Operating temp	+41°F to +95°F
	Other conditions	Keep level when operating. Less than 75% operating humidity
Input	Video (1,2)	1.0 V p-p at 75ohm load, sync negative
		S-Video input (Y: 1.0Vp-p, C: 0.286Vp-p at 75ohm
	Audio (1,2)	Max. Audio input level : 2Vrms
	DV Input	IEEE 1394(4p) compatible jack
Output	Receivable Channels	Regu;ar TV broadcasting: VHF (2~13), UHF (14~69)
		Cable TV broadcasting: 1~125
	Audio	Analogue output jacks 1,2
		Optical/coaxial digital audio output
		Full scale Analog output level: 2Vrms
	Video	Video output jack1
		S-Video output X 1 (Y: 1.0Vp-p, C:0.286Vp-p at 75 ohm load)
		Component output X 1 (Y: 1.0Vp-p ,Pb:0.70Vp-p, Pr:0.70Vp-p at 75ohm load)
Recording	Picture compression format	MPEG-II
	Audio compression format	Dolby digital 2ch/256kbps, MPEG-II
	Recording Quality	XP (about 8Mbps), SP (about 4.5Mbps), LP (about 2Mbps), EP (about 1.6 Mbps or about 1.2 Mbps)
	Audio frequency characteristics	20 Hz ~ 20 KHz

2-2 Chassis Product Specification

General	Model Name	DVD-HR720
Info	Function	Standard
SYSTEM	COLOR SYSTEM	NTSC
	BROADCAST SYSTEM	M
	AUTO CLOCK	OK
RECORDER FUNCTION	DVD-RAM	OK
	DVD-R	OK
	DVD-RW	OK
	VIDEO	MPEG-2
	AUDIO	2ch
	DVD-RAM/-R(4.7GB	OK
	HDD	120GB
	Flexible Recording	OK
	OTR	OK
	Time Slip	OK
	VCR Plus+/Show View/G-Code	-
	Quick Dubbing	OK
	EPG(Gemstar)	OK
SUB FUNCTION	IR Blaster	OK
	Play List	OK
	Auto Chaptering	OK
	JPEG Browser with BG music	-
	DV Input	OK
	10in2 Memory Slot	-
PLAYBACK FUNCTION	DVD-RAM/-R/-RW	OK/OK/(OK)
	DVD-Video/VCD/CD-DA	OK/-/OK
	CD-R/RW	OK/OK
	Music CD	OK
	MPEG4/Divx	-
	Multi Memory Card	-
	Progressive Scan Output	OK
	Upscaling(720P/1080i)	OK
IN/OUT	Video/Audio in RCA Jack (on the front)	Yes (AV2)
	Video/Audio in RCA Jack (on the rear)	Yes (AV1)
	Video/Audio out RCA Jack (on the rear)	Yes x 1
	Additional Audio output (on the rear)	Yes x 1
	Aerial In / Ant.- out (on the rear)	Yes
	Coaxial Digital Audio output	es x 1
	Optical Digital Audio output	Yes x 1
	S-Video output (on the rear)	Yes x 1
	S-Video input (on the front)	-
	S-Video input (on the rear)	Yes x 1
	DV input (on the front)	Yes
	Component VIdeo Output	Yes

2-3 Option Product Specification

Description Fig	Description	Parts No	Remark
	Remote Control	AC59-00023L	Model Standard of DVD-HR720/XAA
	Batteries for Remote Control	AC43-12002H	Model Standard of DVD-HR720/XAA S.N.A
	User's Manual	AK68-00758B	Model Standard of DVD-HR720/XAA
	Quick Guide	AK68-00827B	Model Standard of DVD-HR720/XAA S.N.A
	Video/Audio Cable	AC39-00073A	Model Standard of DVD-HR720/XAA
	RF Cable	AC39-42001J	Model Standard of DVD-HR720/XAA
	IR Blaster cable	AK39-00055A	Model Standard of DVD-HR720/XAA
	TV Guide Setup Quick Guide	AK68-000827D	Model Standard of DVD-HR720/XAA S.N.A

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3. Software Update

3-1 Drive Firmware Update

3-1-1 Introduction

When you can not record and play on specific recording media (especially on newly available DVD-RAM, DVD-RW or DVD-R).

3-1-2 How to make an update disc

• Write the downloaded file onto a blank CD-R or CD-RW disc, using the following settings :

1) Download the software update file from the samsung internet site. (**www.samsung.com)**

2) Write the file to disc using the CD-RW of your computer.

NOTE

- Recommended Application Program
  - Nero Burning / Easy CD Creator ..etc
- Option
  - Name : SDM2224
  - Extension name : “*.REC”
  - Multisession : No Multisession
  - File name lenght : Max. of 11 = 8 + 3
  - Format : Mode 1
  - Character set : ISO 9660 or Joliet Format
  - CD Close & Dise at once

WARNING

Very important : please read the notice below before updating your unit.

The following events may interrupt the update process and MAY RESULT IN PERMANENT DAMAGE TO THE UNIT WHILE UPDATING

① Unplugging the power cord.
② Power Outage.
③ Dirt or Scratches on the disc.
④ Opening a disc tray during processing.

1) Press **OPEN/CLOSE** to open the disc tray.
2) Insert the update CD-R disc with the software update, label facing up.
3) Press **OPEN/CLOSE** to close the disc tray.

* It takes about 1~2 minites before the mesage below appears.

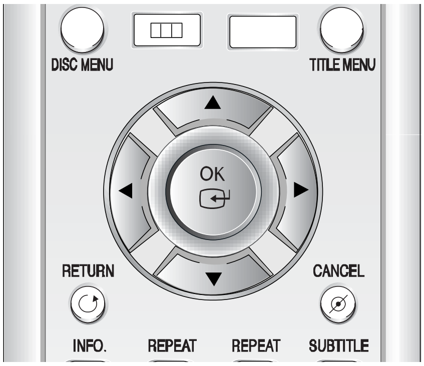
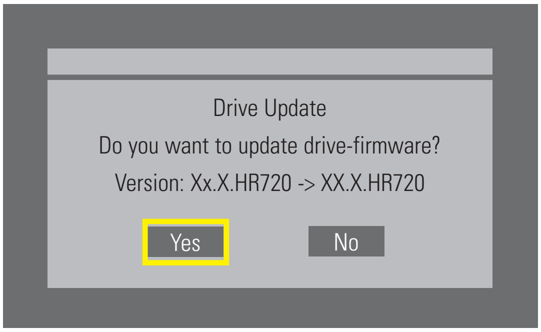


Fig. 3-1 Remote Control



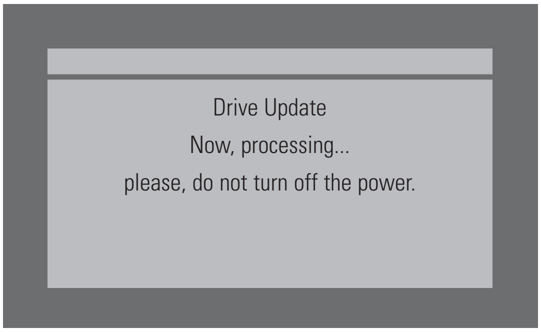
Drive Update
Do you want to update drive-firmware?
Version: Xx.X.HR720 -> XX.X.HR720

Fig. 3-2

Atfer checking old and new version, select “Yes” or “No” with “ ◀ ” or “ ▶ ” on the remote control.
* The Version is indicated by “XX.X modelname”

* If you don’t see the message above, try another disc. Generally, this is caused by disc quality and by disc creating problem.

4) Press the **OK** button on the remote control (Fig. 3-1).

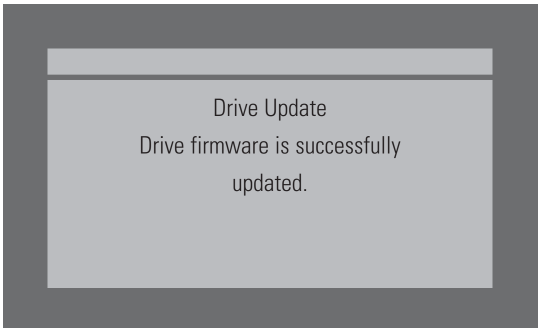


Drive Update
Now, processing...
please, do not turn off the power.

Fig.3-3

You will see “LOAD” on FLT Display.

5) It takes about 1~2 minutes to complete the update.
The message below will be displayed in the screen after update is completed and the tray will open automatically.



Drive Update
Drive firmware is successfully updated.

Fig. 3-4

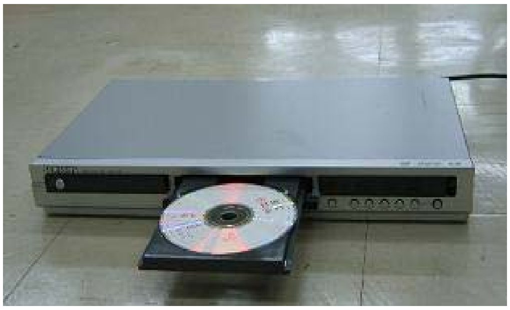


Fig. 3-5

6) After removing the update disc, turn off the unit with power button.
Turn on the power again the tray will then close.
The drive firmware is now complete.

3-2 Flash Update

3-2-1 Introduction

When you encounter the problem which is not related in drive firmware necessity.

3-2-2 How to make an update disc

Write the downloaded file onto a blank CD-R or CD-RW disc, using the following settings :

1) Download the software update file from the samsung internet site. (**www.samsung.com)**

2) Write the file to disc using the CD-RW of your computer.

NOTE

- Recommended Application Program
  - Nero Burning / Easy CD Creator ..etc
- Option
  - Multisession : No Multisession
  - CD close & disc at once
  - ISO 9660 or joliet format
  - Extension name : “*.RUF”
- In order to increase disc playability, add a dummy file (over 100MB) together with the latest program. (The dummy file can be any kind of file except MP3 file etc which can be played in the unit and we recommend to use a file whose extension name as “*.dmy”, which can be changed from original one.)

WARNING

Very important : please read the notice below before updating your unit.

The followong events may interrupt the update process and MAY RESULT IN PERMANENT DAMAGE TO THE UNIT WHILE UPDATING

① Unplugging the power cord.
② Power Outage.
③ Dirt or Scratches on the disc.
④ Opening a disc tray during processing.

1) Press **OPEN/CLOSE** to open the disc tray.
2) Insert the update CD-R disc with the software update, label facing up.
3) Press **OPEN/CLOSE** to close the disc tray.

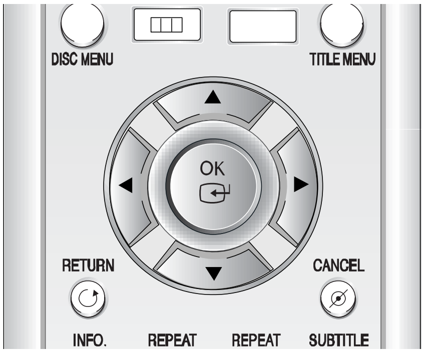


Fig. 3-6 Remote Control

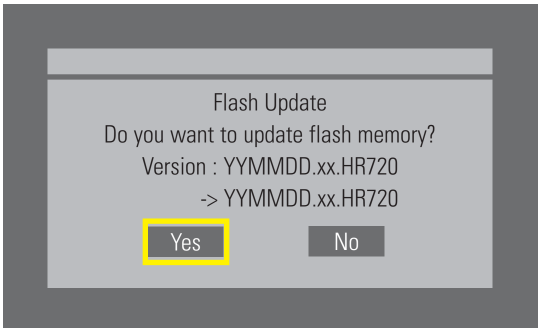

Flash Update
Do you want to update flash memory?
Version : YYMMDD.xx.HR720
-> YYMMDD.xx.HR720

Fig. 3-7

Atfer checking old and new version, select “Yes” or “No” with “◀” or “▶” on the remote control.
* The Version is indicated by “YYMMDD.xx modelname”

* If you don’t see the message above, try another disc.
Generally, this is caused by disc quality and by disc creating problem.

4) Press the **OK** button on the remote control (Fig. 3-6).

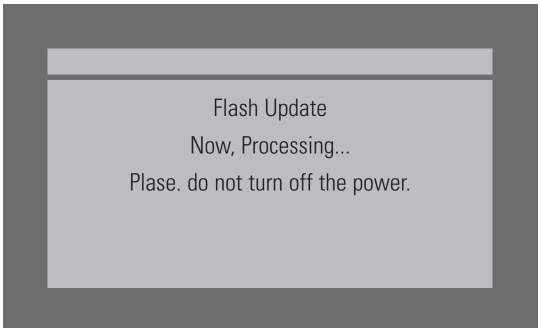

Flash Update
Now, Processing...
Plase. do not turn off the power.

Fig. 3-8

5) It takes about 5 minutes to complete the update.
The message below will be displayed in the screen after update is completed and the tray will open automatically.

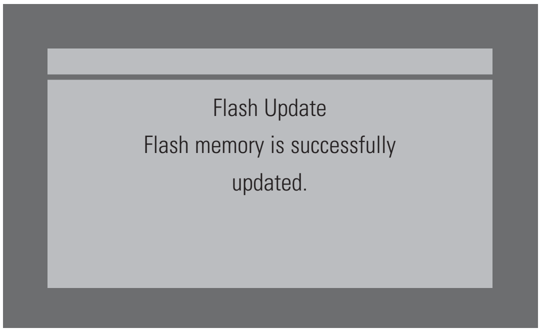

Flash Update
Flash memory is successfully updated.

Fig. 3-9

* If the message to the left isn’t displayed after 10minutes and the unit is no longer functioning properly, contact a samsung authorized service center.

6) After removing the update disc, turn off the unit with power button.
Turn on the power again and the tray will then close.
The Flash update is now complete.

4. Disassembly and Reassembly

4-1 Cabinet and PCB

Note : Reassembly in reverse order.

4-1-1 Top Cabinet Removal

1) Remove 5 Screws ❶, ❷.
2) Lift up the Top Cabinet in direction of arrow.

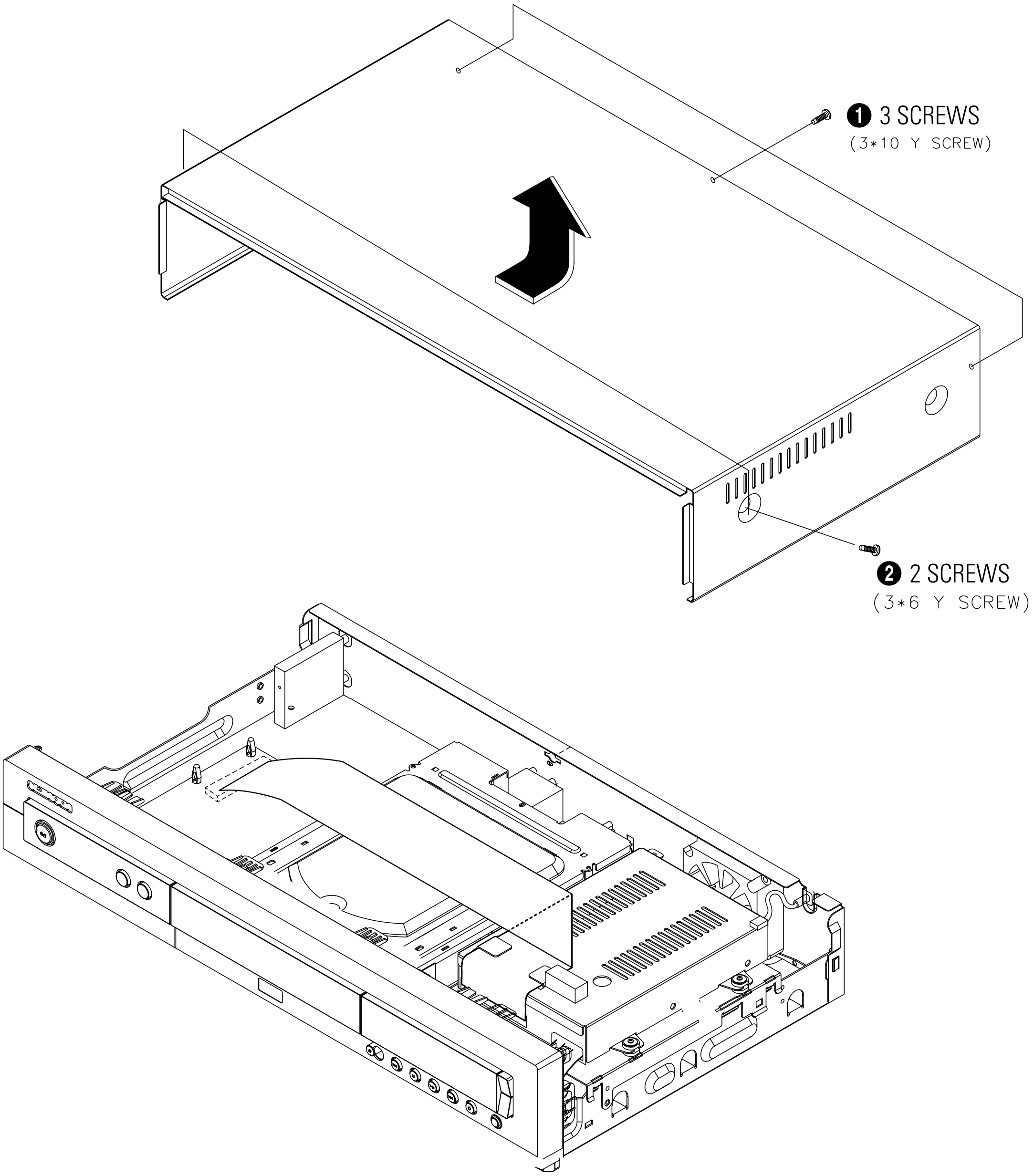

❶ 3 SCREWS
(3*10 Y SCREW)
❷ 2 SCREWS
(3*6 Y SCREW)

Fig. 4-1 Top Cabinet Removal

4-1-2 Ass’y Front-Cabinet Removal

1) Release 6 Hooks ❶, ❷, ❸, ❹ and Ass’y Front-Cabinet ❺.

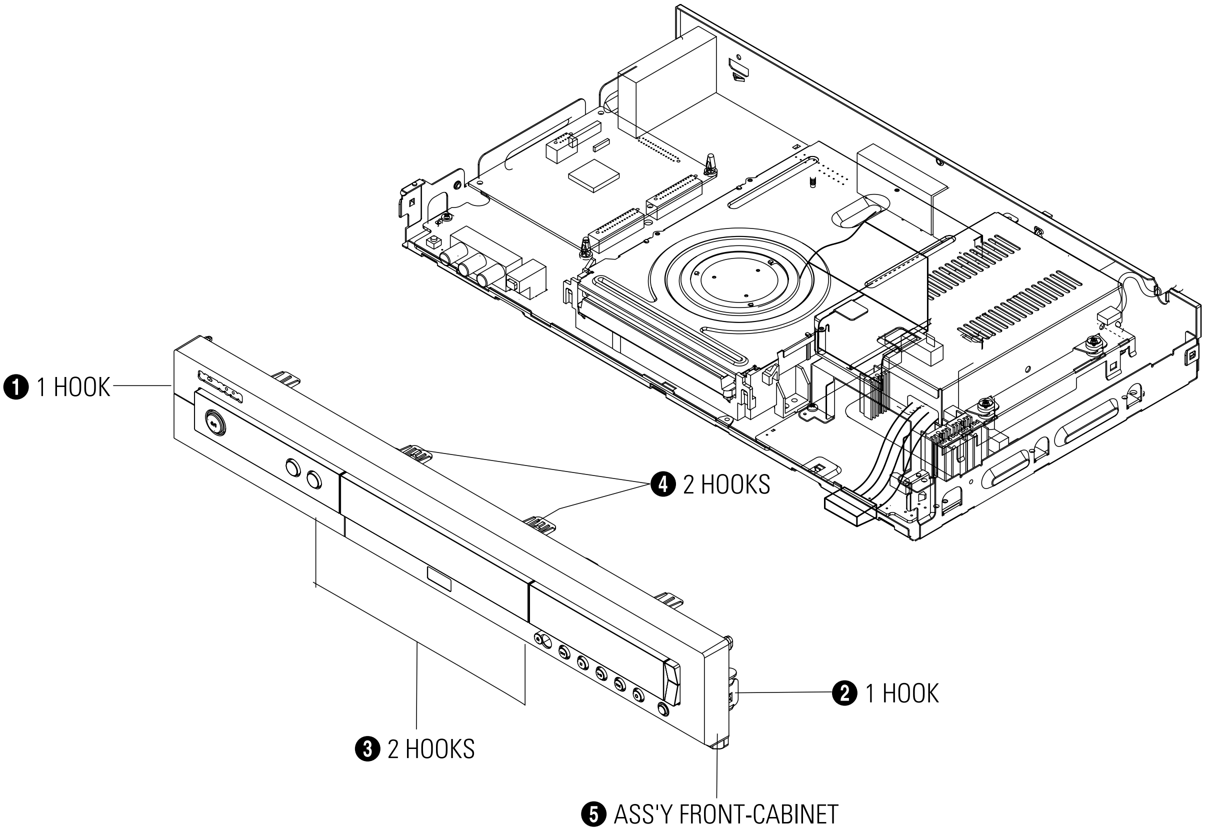

❶ 1 HOOK
❹ 2 HOOKS
❷ 1 HOOK
❸ 2 HOOKS
❺ ASS'Y FRONT-CABINET

Fig. 4-2 Ass’y Front-Cabinet Removal

4-1-3 Hard Disk Removal

1) Remove 7 Screws ❶, ❷ from the Hard Disk and lift it up.

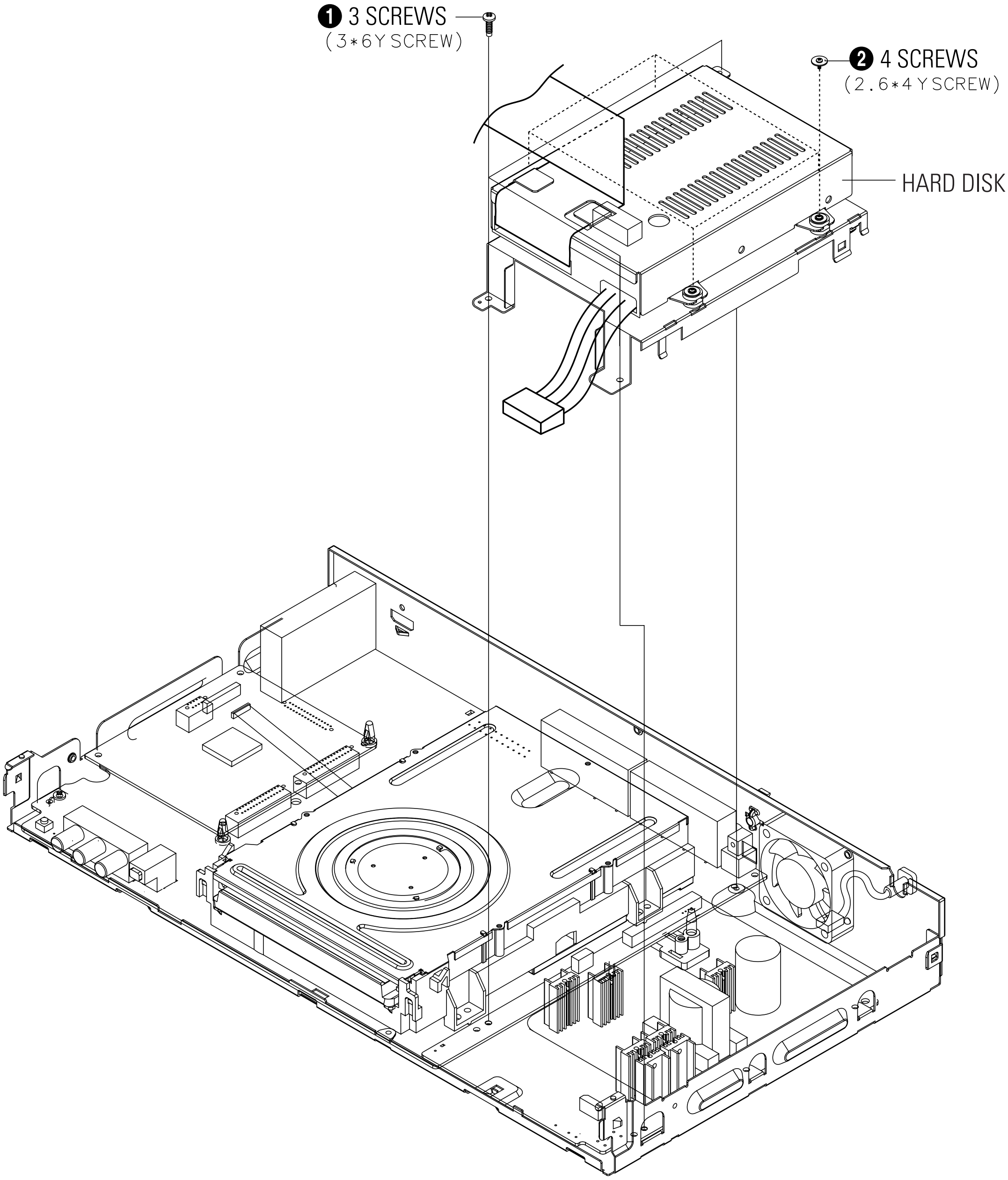

❶ 3 SCREWS
(3*6Y SCREW)
❷ 4 SCREWS
(2.6*4 Y SCREW)
HARD DISK

Fig. 4-3 Hard Disk Removal

4-1-4 Ass’y Deck, Main PCB and S.M.P.S. PCB Removal

1) Remove 4 Screws ❶, ❷ from the Ass’y Deck and lift it up.
2) Remove 2 Screws ❸ from the Main PCB ❹ and lift it up.
3) Remove 2 Screws ❺ from the S.M.P.S. PCB ❻ and lift it up.

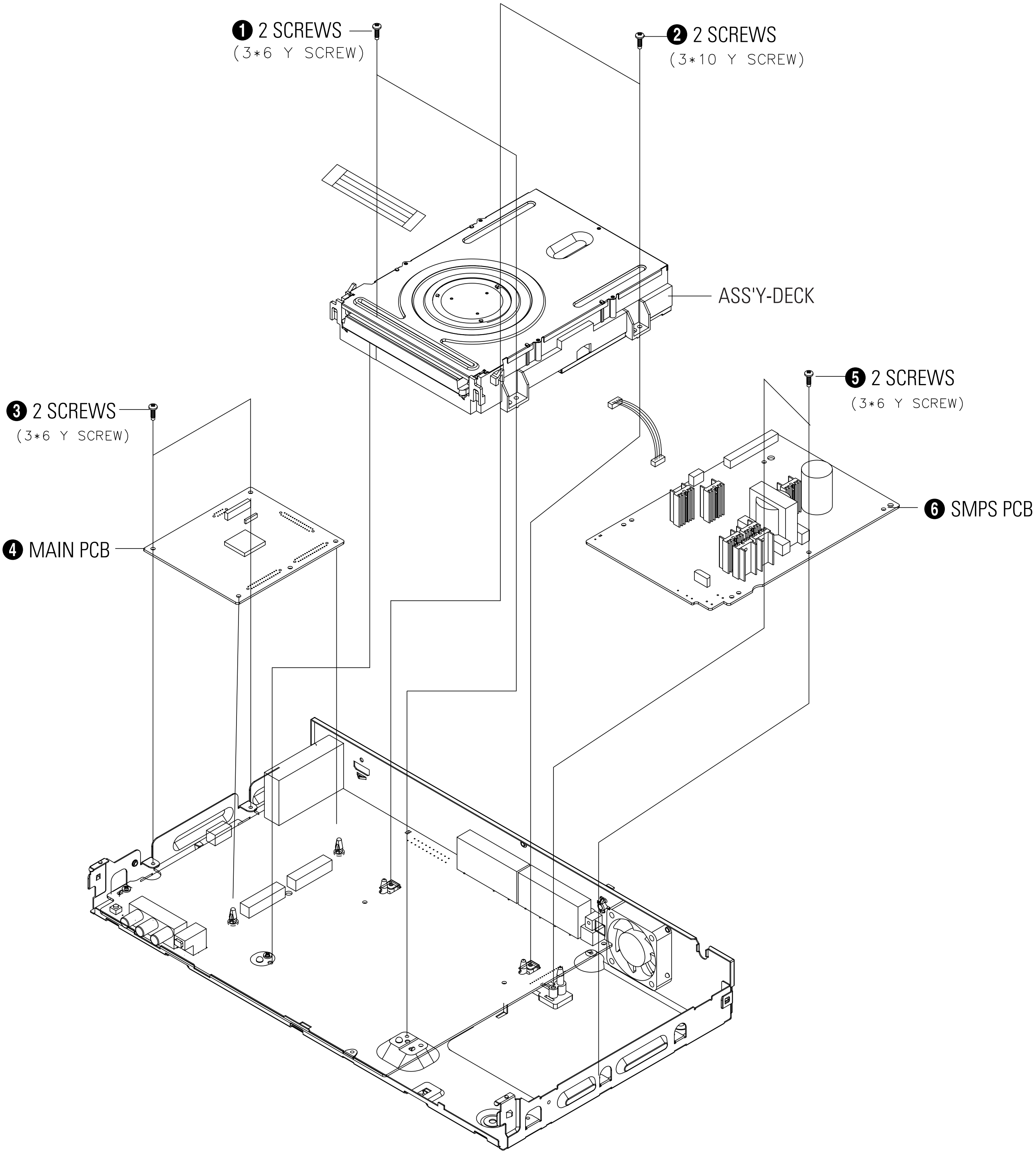

❶ 2 SCREWS
(3*6 Y SCREW)
❷ 2 SCREWS
(3*10 Y SCREW)
ASS'Y-DECK
❺ 2 SCREWS
(3*6 Y SCREW)
❸ 2 SCREWS
(3*6 Y SCREW)
❻ SMPS PCB
❹ MAIN PCB

Fig. 4-4 Ass’y Deck, Main PCB and S.M.P.S. PCB Removal

4-1-5 Jack PCB Removal

1) Remove 4 Screws ❶, ❷ from the Jack PCB ❸ and lift it up.

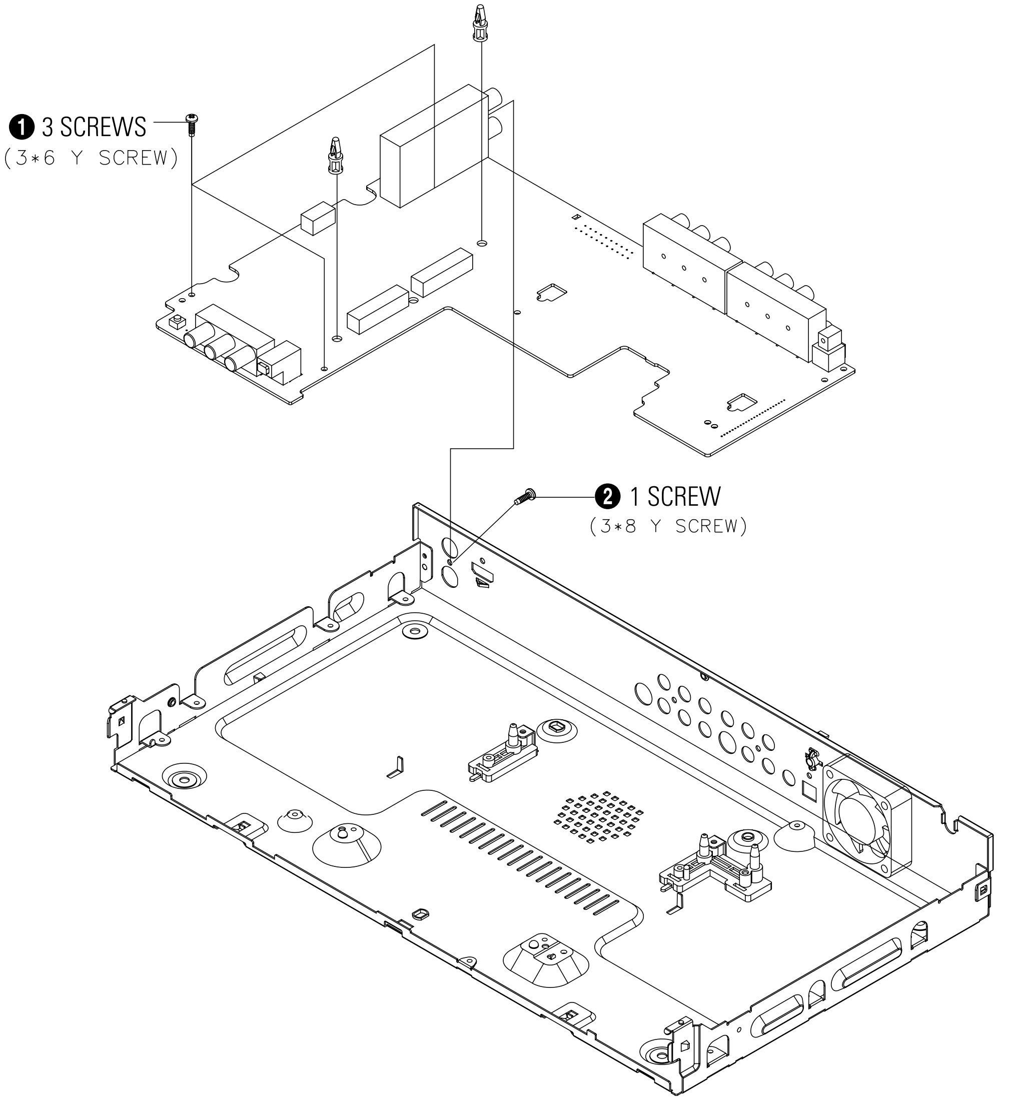

❶ 3 SCREWS
(3*6 Y SCREW)
❷ 1 SCREW
(3*8 Y SCREW)

Fig. 4-5 Jack PCB Removal

4-1-6 DC FAN Removal

1) Remove 2 Screws ❶, from the DC Fan ❷ and lift it up.

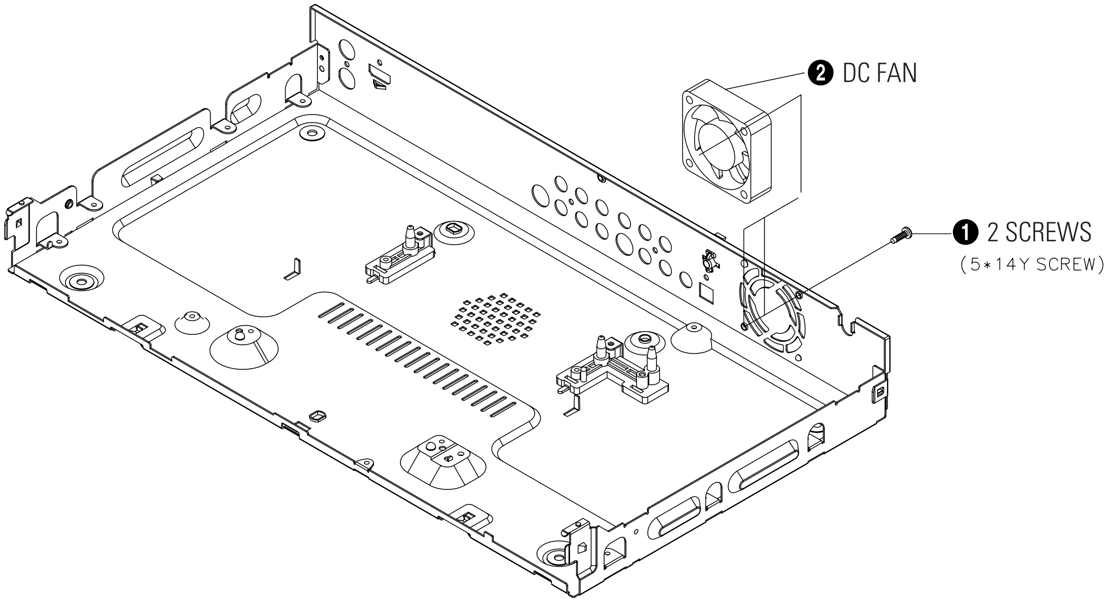

❷ DC FAN
❶ 2 SCREWS
(5*14Y SCREW)

Fig. 4-6 DC FAN Removal

4-2 PCB Location

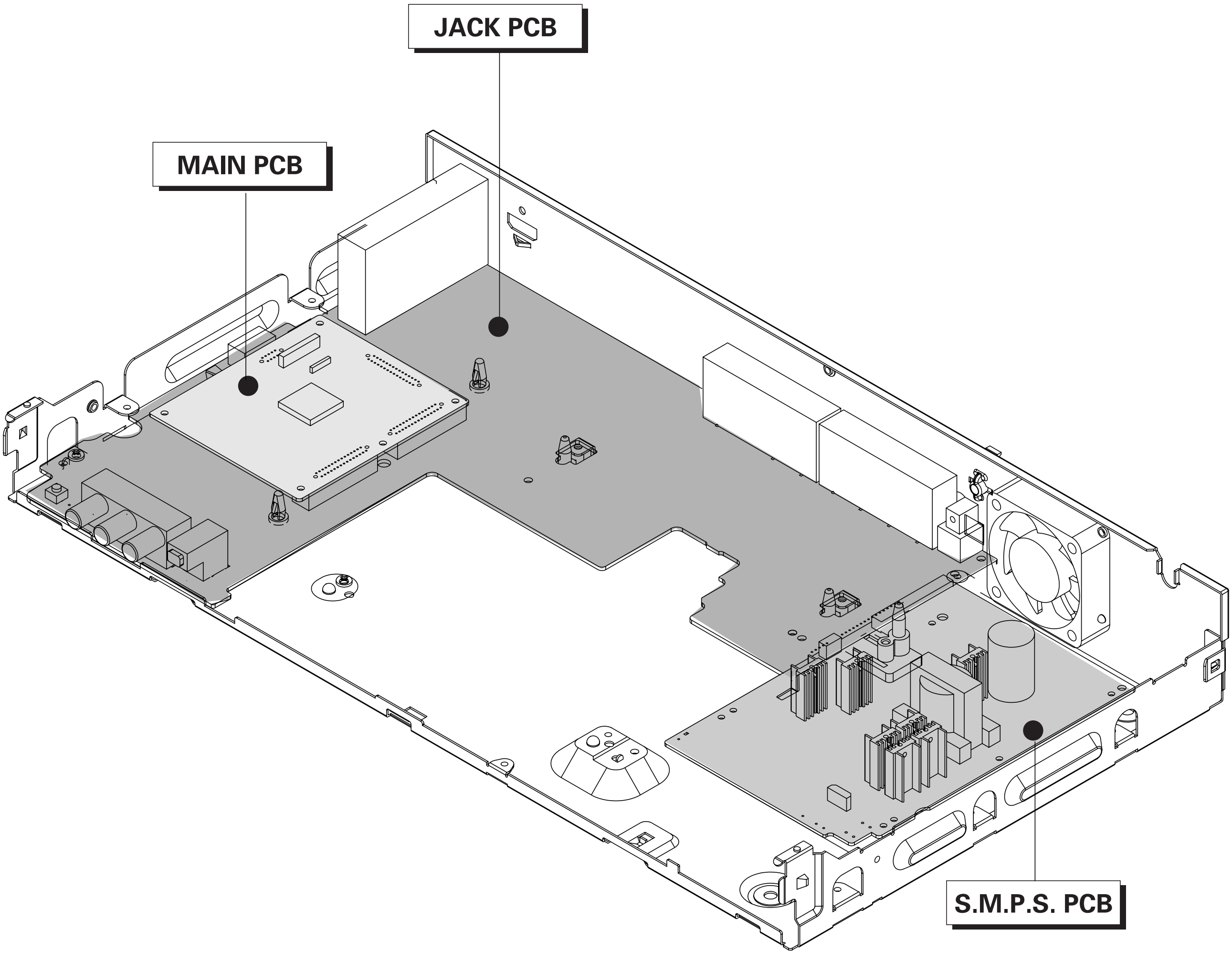
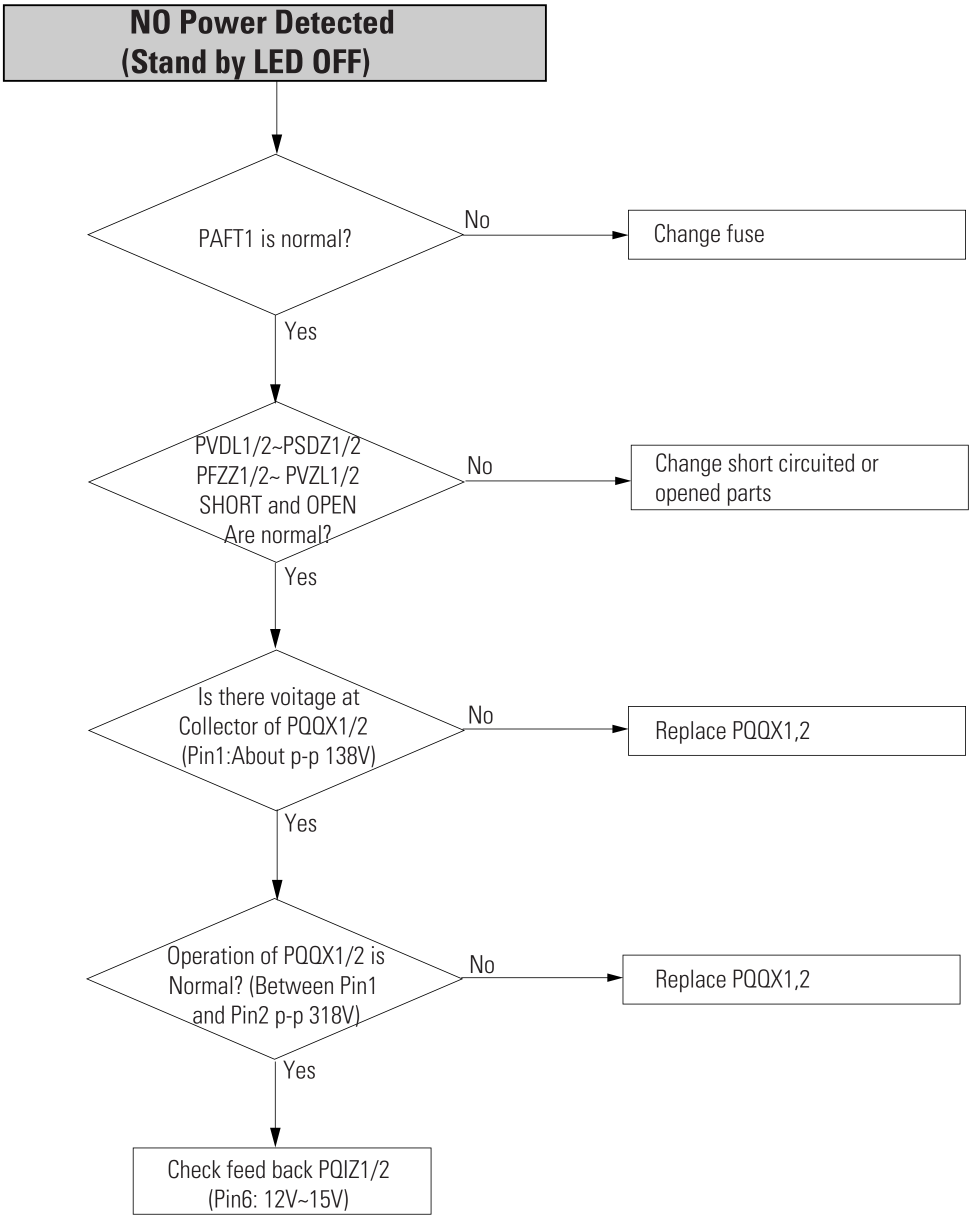
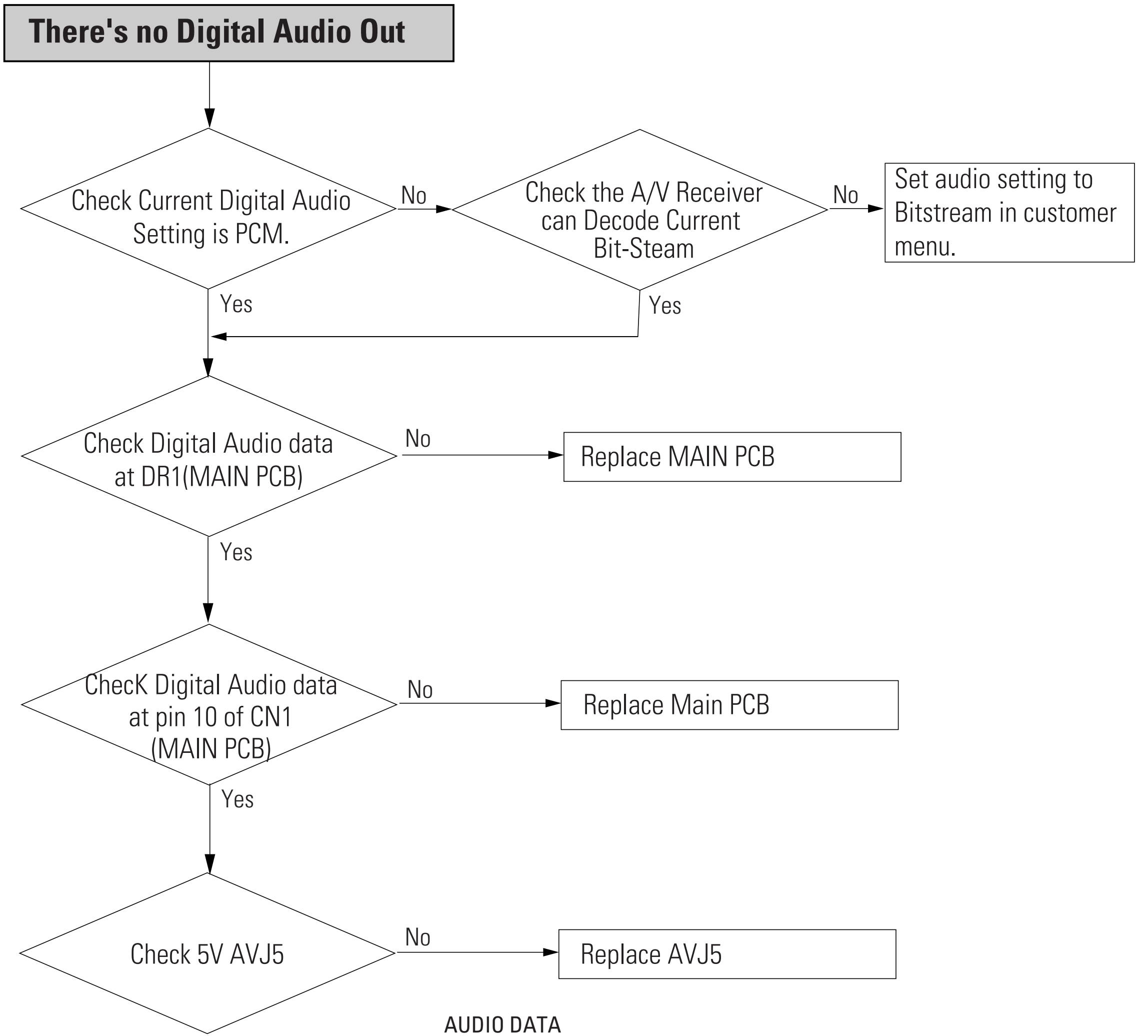

JACK PCB
MAIN PCB
S.M.P.S. PCB

Fig. 4-7 PCB Location

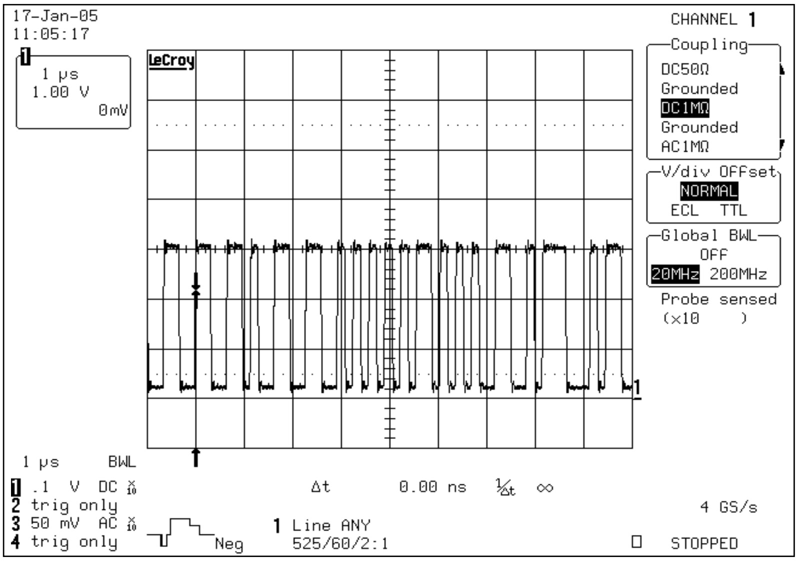
MEMO

5. Troubleshooting


NO Power Detected
(Stand by LED OFF)
PAFT1 is normal?
No
Change fuse
Yes
PVDL1/2~PSDZ1/2
PFZZ1/2~ PVZL1/2
SHORT and OPEN
Are normal?
No
Change short circuited or opened parts
Yes
Is there voitage at
Collector of PQQX1/2
(Pin1:About p-p 138V)
No
Replace PQQX1,2
Yes
Operation of PQQX1/2 is
Normal? (Between Pin1
and Pin2 p-p 318V)
No
Replace PQQX1,2
Yes
Check feed back PQIZ1/2
(Pin6: 12V~15V)


There's no Digital Audio Out
Check Current Digital Audio Setting is PCM.
No
Check the A/V Receiver can Decode Current Bit-Steam
No
Set audio setting to Bitstream in customer menu.
Yes
Yes
Check Digital Audio data at DR1(MAIN PCB)
No
Replace MAIN PCB
Yes
ChecK Digital Audio data at pin 10 of CN1 (MAIN PCB)
No
Replace Main PCB
Yes
Check 5V AVJ5
No
Replace AVJ5
Yes
Check the Cable

AUDIO DATA

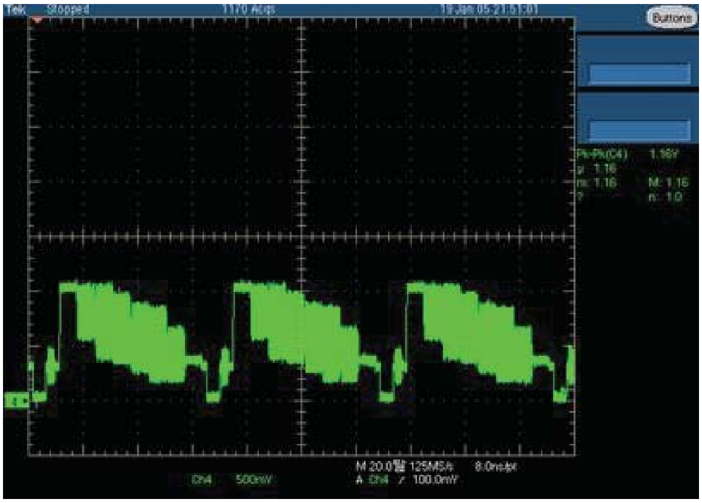

17-Jan-05
11:05:17
LeCroy
1 μs
1.00 V
0mV
CHANNEL 1
Coupling
DC50Ω
Grounded
DC1MΩ
Grounded
AC1MΩ
V/div Offset
NORMAL
ECL TTL
Global BWL
OFF
20MHz 200MHz
Probe sensed
(x10)
1 μs BWL
1 .1 V DC
2 trig only
3 50 mV AC
4 trig only
Neg
Δt 0.00 ns 1/Δt ∞
1 Line ANY
525/60/2:1
4 GS/s
STOPPED

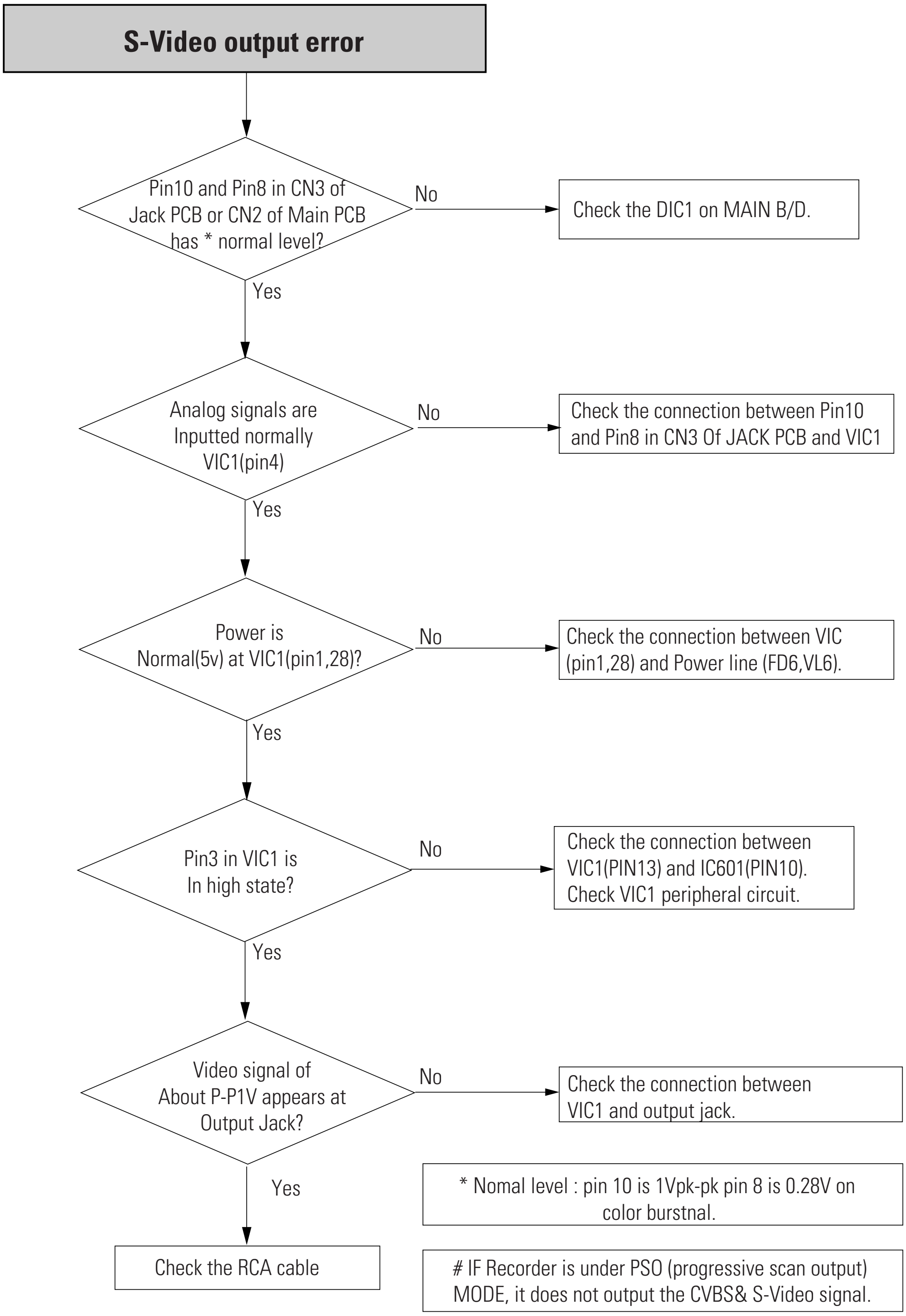
CVBS (Video) output error

- PIN 12 of CN3 of Jack PCB or CN2 of Main PCB has 1V pk-pk level?
  - No → Check the DIC1 on MAIN B/D .
  - Yes ↓
- Analog signals are Inputted normally VIC1(pin4)
  - No → Check the connection between 12Pin in CN3 Of JACK PCB and VIC1
  - Yes ↓
- Power is Normal(5v) at VIC1(pin1,28)?
  - No → Check the connection between VIC1(pin1,28) and Power line (FD6,VL6).
  - Yes ↓
- Pin3 in VIC1 is In high state?
  - No → Check the connection between VIC1(PIN3) and IC601(PIN10). Check VIC1 peripheral circuit.
  - Yes ↓
- Video signal of About P-P1V appears at Output Jack?
  - No → Check the connection between VIC1 and output jack.
  - Yes ↓
- Check the RCA Cable

# IF Recorder is under PSO (progressive scan output) MODE, it does not output the CVBS& S-Video signal.

CVBS(Color-bar)

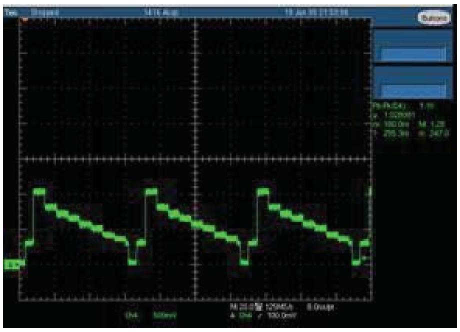

Tek
Stopped
1170 Acqs
19 Jan 05 21:51:01
Buttons
Pk-Pk(C4) 1.16V
Ch4 500mV
M 20.0µs 125MS/s 8.0ns/pt
A Ch4 ∕ 100.0mV


S-Video output error
Pin10 and Pin8 in CN3 of Jack PCB or CN2 of Main PCB has * normal level?
No
Check the DIC1 on MAIN B/D.
Yes
Analog signals are Inputted normally VIC1(pin4)
No
Check the connection between Pin10 and Pin8 in CN3 Of JACK PCB and VIC1
Yes
Power is Normal(5v) at VIC1(pin1,28)?
No
Check the connection between VIC (pin1,28) and Power line (FD6,VL6).
Yes
Pin3 in VIC1 is In high state?
No
Check the connection between VIC1(PIN13) and IC601(PIN10). Check VIC1 peripheral circuit.
Yes
Video signal of About P-P1V appears at Output Jack?
No
Check the connection between VIC1 and output jack.
Yes
Check the RCA cable

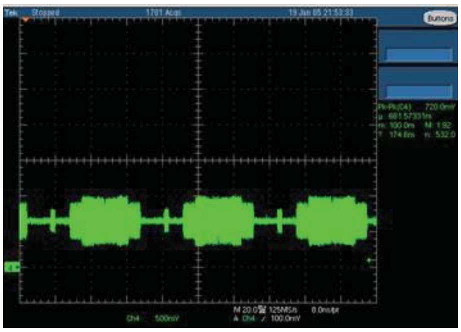
* Nomal level : pin 10 is 1Vpk-pk pin 8 is 0.28V on color burstnal.

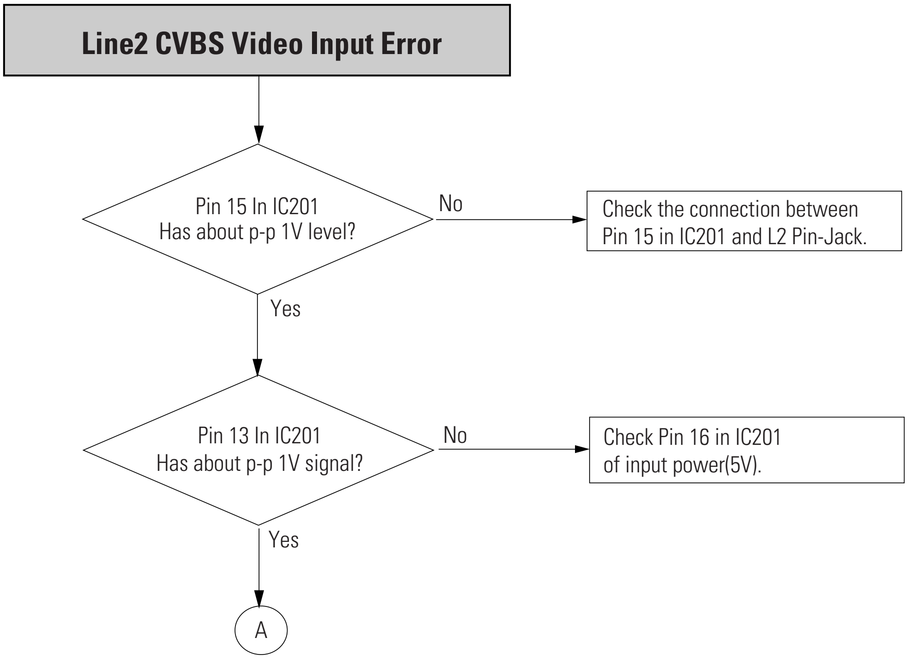
# IF Recorder is under PSO (progressive scan output) MODE, it does not output the CVBS& S-Video signal.

Y(Color-bar)

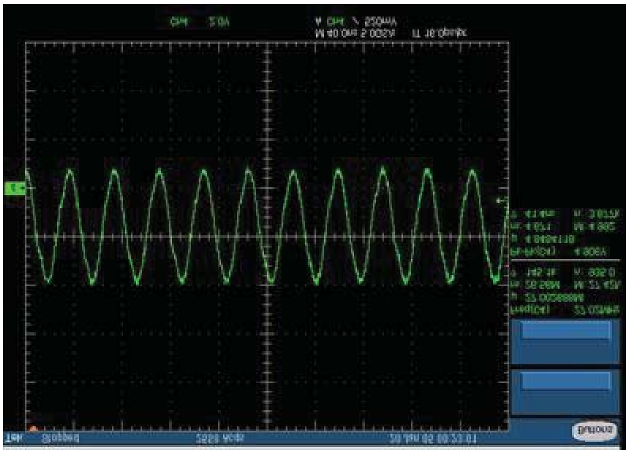


C(Color-bar)

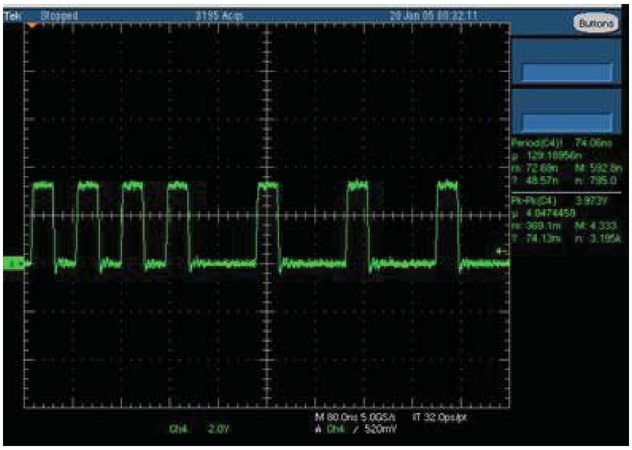


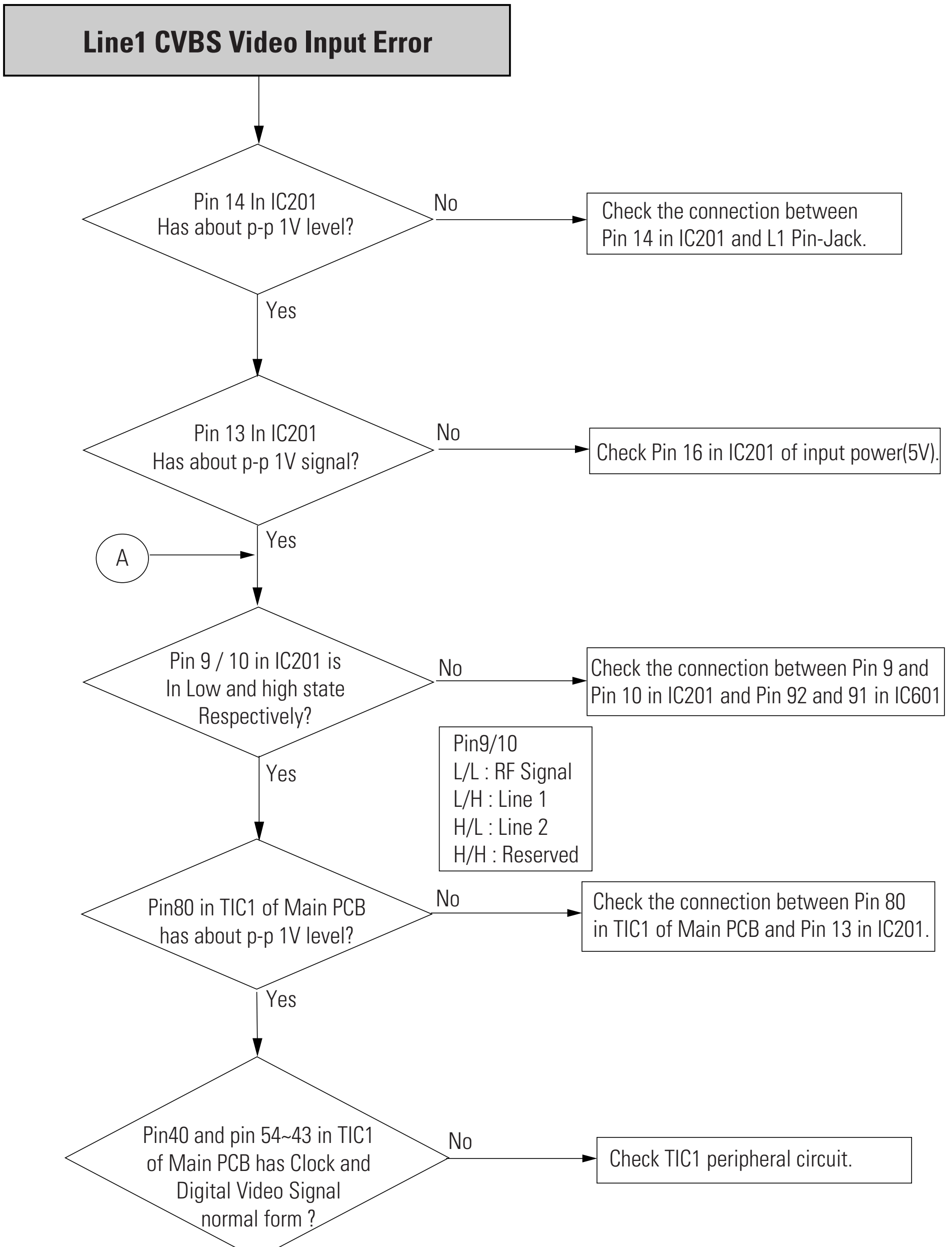

Line2 CVBS Video Input Error
Pin 15 In IC201
Has about p-p 1V level?
No
Check the connection between
Pin 15 in IC201 and L2 Pin-Jack.
Yes
Pin 13 In IC201
Has about p-p 1V signal?
No
Check Pin 16 in IC201
of input power(5V).
Yes
A

TIC1-Clock

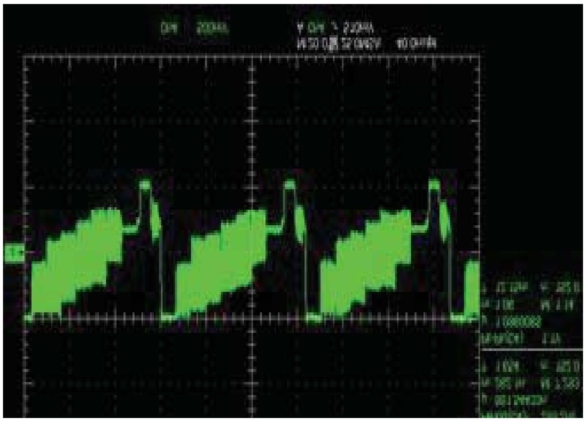


TIC1-DATA

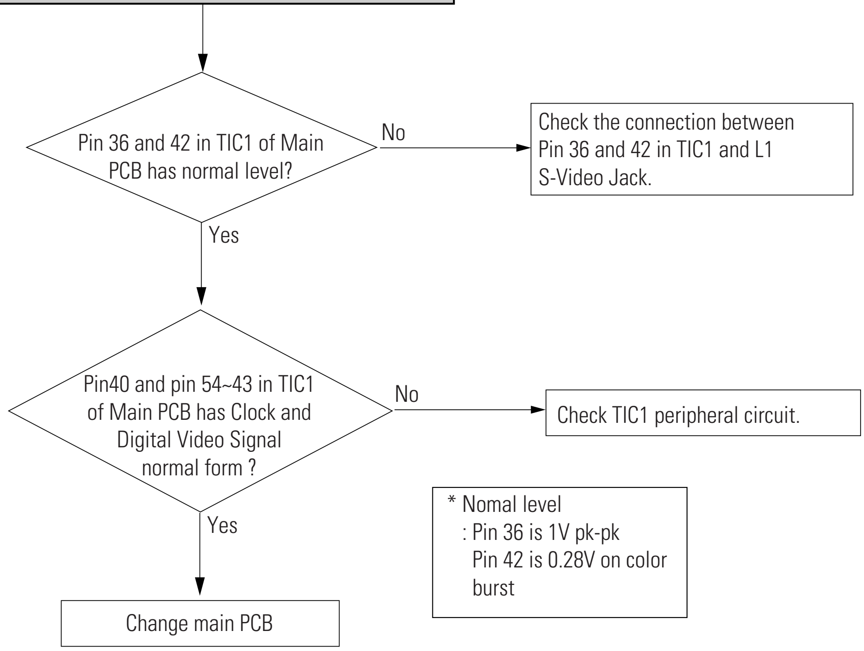

Tek Stopped
3195 Acqs
20 Jan 05 08:22:11
Buttons
Period(C4) 74.06ns
Pk-Pk(C4) 3.973V
M 80.0ns 5.0GS/s
IT 32.0ps/pt
Ch4 2.0V
Ch4 ∕ 520mV


Line1 CVBS Video Input Error
Pin 14 In IC201
Has about p-p 1V level?
No
Check the connection between
Pin 14 in IC201 and L1 Pin-Jack.
Yes
Pin 13 In IC201
Has about p-p 1V signal?
No
Check Pin 16 in IC201 of input power(5V).
Yes
A
Pin 9 / 10 in IC201 is
In Low and high state
Respectively?
No
Check the connection between Pin 9 and
Pin 10 in IC201 and Pin 92 and 91 in IC601
Pin9/10
L/L : RF Signal
L/H : Line 1
H/L : Line 2
H/H : Reserved
Yes
Pin80 in TIC1 of Main PCB
has about p-p 1V level?
No
Check the connection between Pin 80
in TIC1 of Main PCB and Pin 13 in IC201.
Yes
Pin40 and pin 54~43 in TIC1
of Main PCB has Clock and
Digital Video Signal
normal form ?
No
Check TIC1 peripheral circuit.
Yes
Change Main PCB

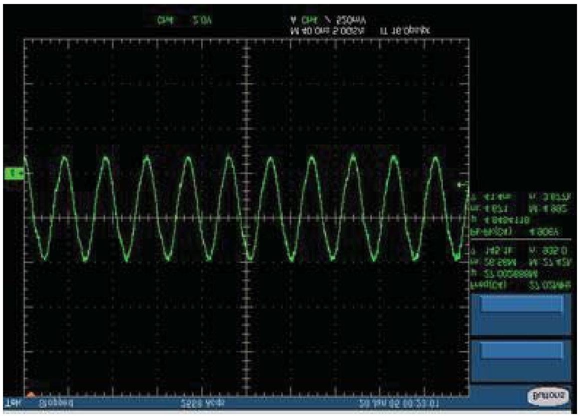
CVBS(Color-bar)



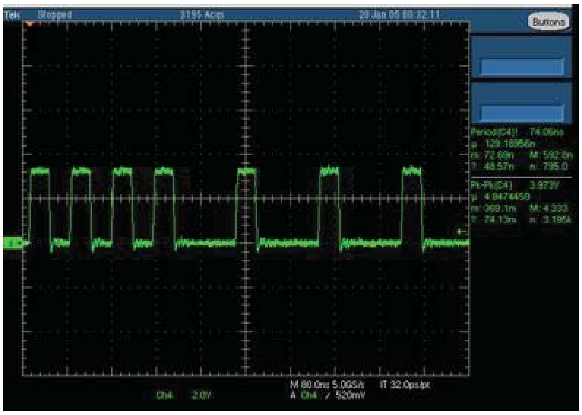
Line1 S-Video Video Input Error

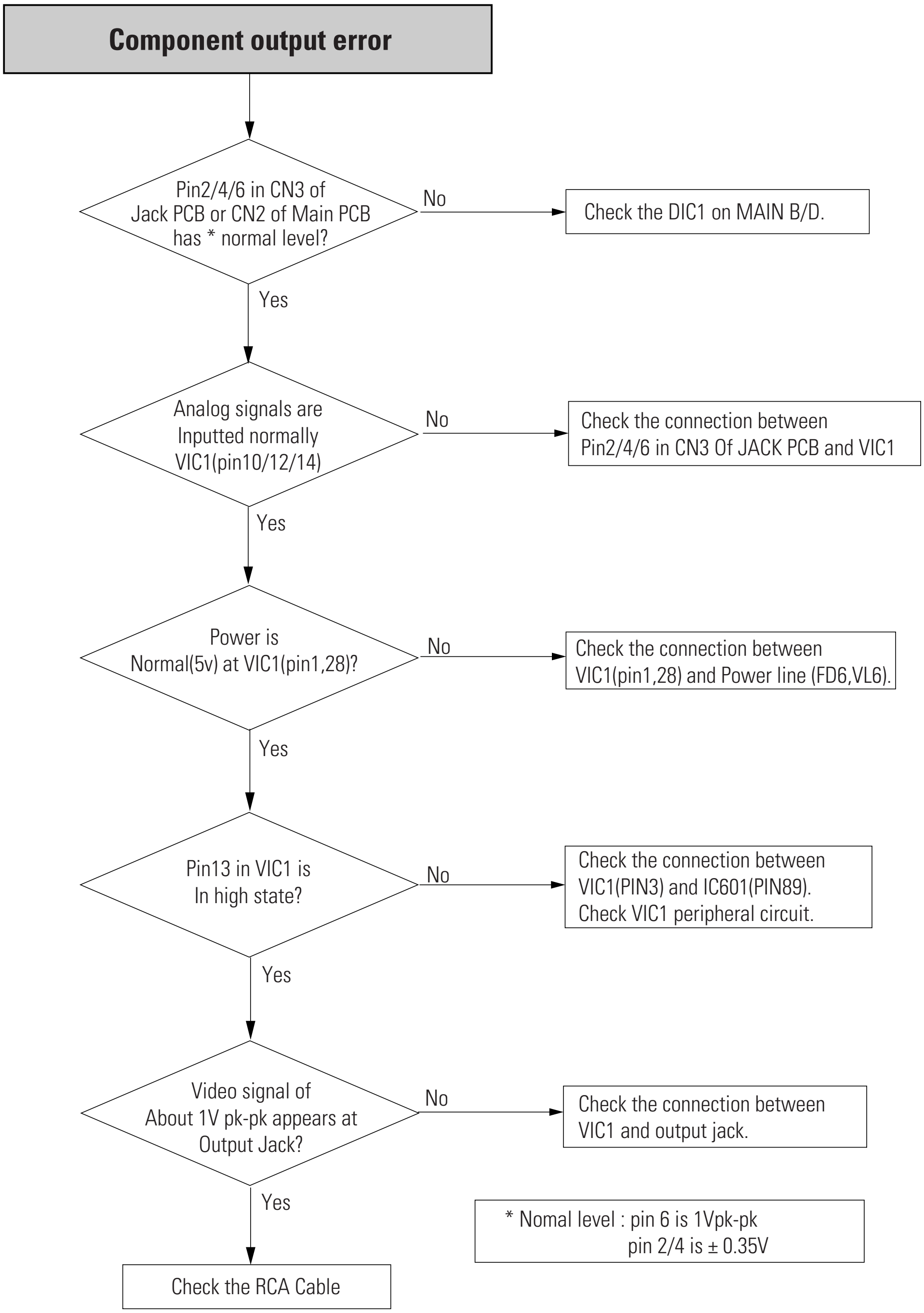

Pin 36 and 42 in TIC1 of Main PCB has normal level?
No
Check the connection between Pin 36 and 42 in TIC1 and L1 S-Video Jack.
Yes
Pin40 and pin 54~43 in TIC1 of Main PCB has Clock and Digital Video Signal normal form ?
No
Check TIC1 peripheral circuit.
Yes
Change main PCB
* Nomal level
: Pin 36 is 1V pk-pk
Pin 42 is 0.28V on color burst

TIC1-Clock



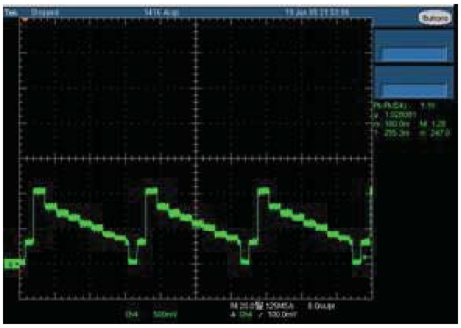
TIC1-DATA



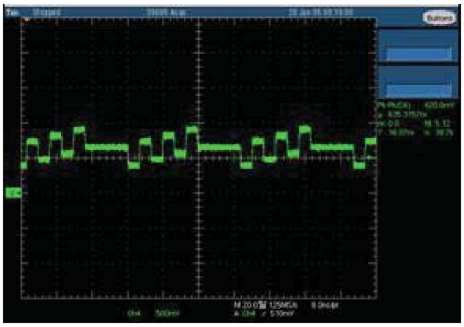

Component output error
Pin2/4/6 in CN3 of Jack PCB or CN2 of Main PCB has * normal level?
No
Check the DIC1 on MAIN B/D.
Yes
Analog signals are Inputted normally VIC1(pin10/12/14)
No
Check the connection between Pin2/4/6 in CN3 Of JACK PCB and VIC1
Yes
Power is Normal(5v) at VIC1(pin1,28)?
No
Check the connection between VIC1(pin1,28) and Power line (FD6,VL6).
Yes
Pin13 in VIC1 is In high state?
No
Check the connection between VIC1(PIN3) and IC601(PIN89). Check VIC1 peripheral circuit.
Yes
Video signal of About 1V pk-pk appears at Output Jack?
No
Check the connection between VIC1 and output jack.
Yes
Check the RCA Cable

* Nomal level : pin 6 is 1Vpk-pk
pin 2/4 is ± 0.35V

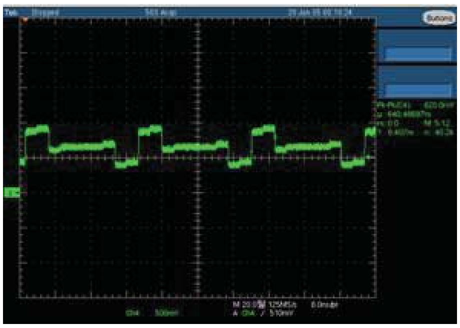
Y(Color-bar)



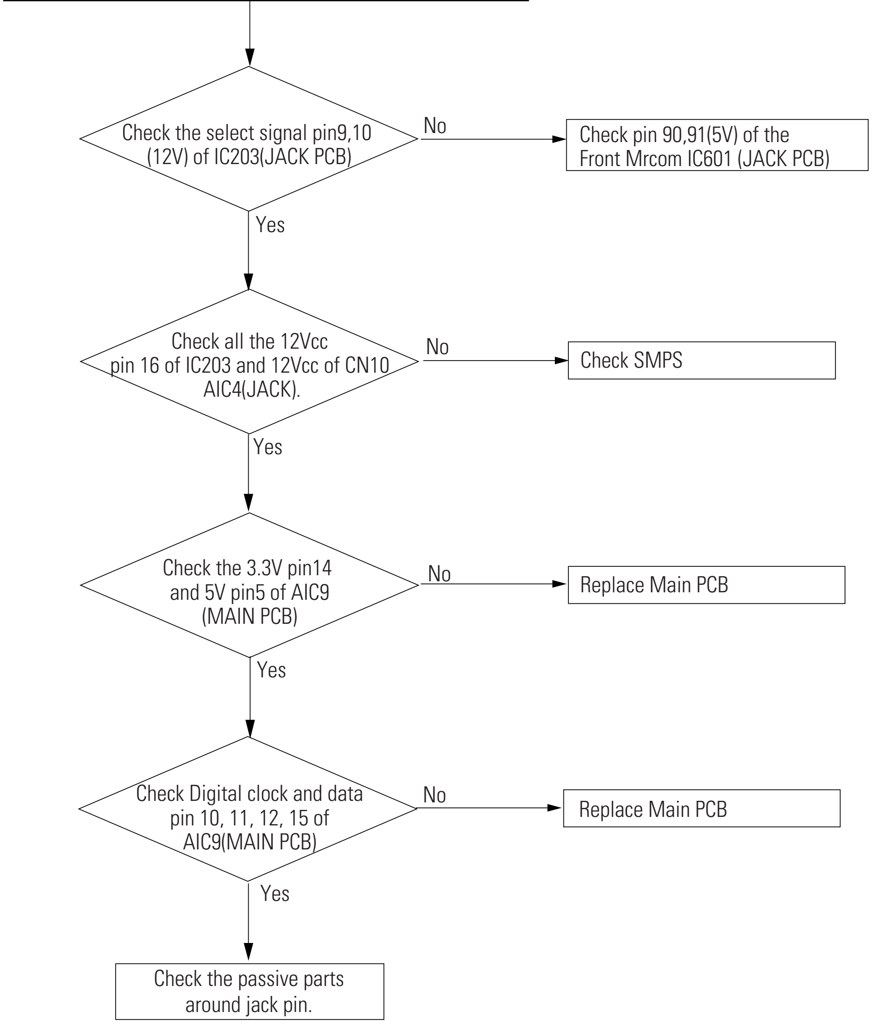
Pb(Color-bar)



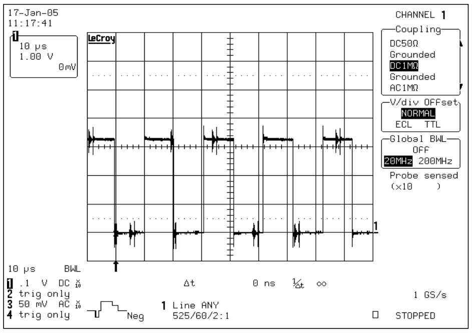
Pr(Color-bar)



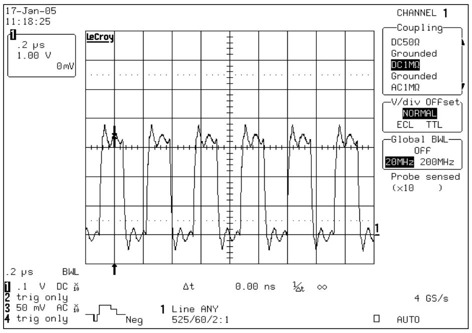
Audio Input is not Recording


Check the select signal pin9,10 (12V) of IC203(JACK PCB)
No
Check pin 90,91(5V) of the Front Mrcom IC601 (JACK PCB)
Yes
Check all the 12Vcc pin 16 of IC203 and 12Vcc of CN10 AIC4(JACK).
No
Check SMPS
Yes
Check the 3.3V pin14 and 5V pin5 of AIC9 (MAIN PCB)
No
Replace Main PCB
Yes
Check Digital clock and data pin 10, 11, 12, 15 of AIC9(MAIN PCB)
No
Replace Main PCB
Yes
Check the passive parts around jack pin.

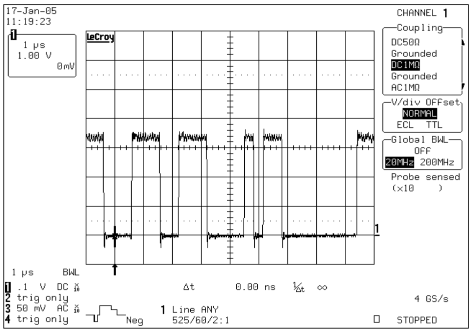
Digital clock(10)



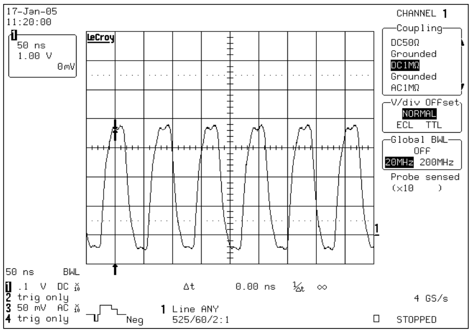
Digital clock(11)

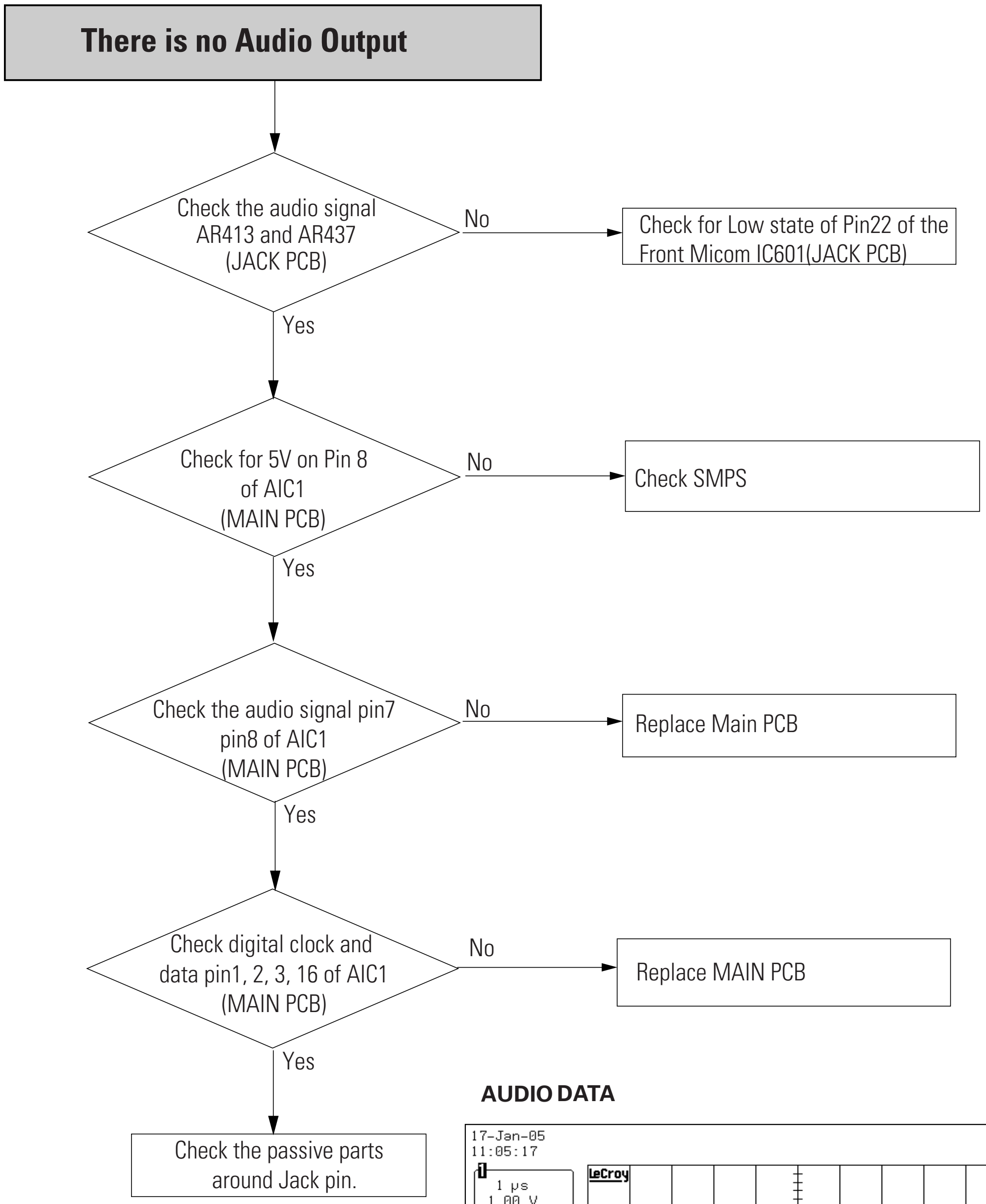


Digital clock(12)

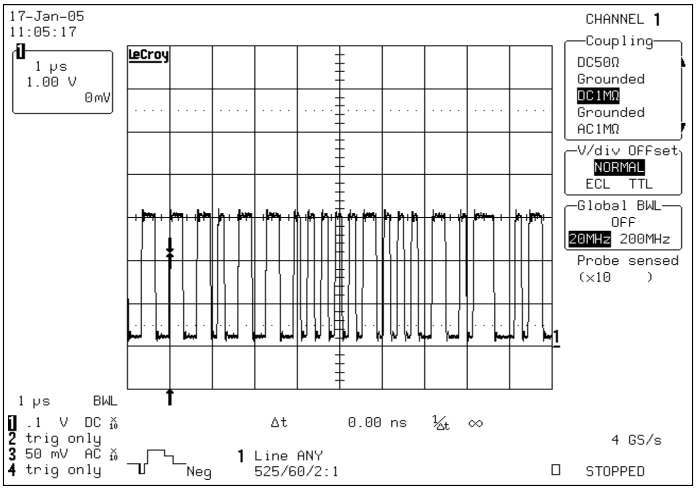


Digital clock(15)

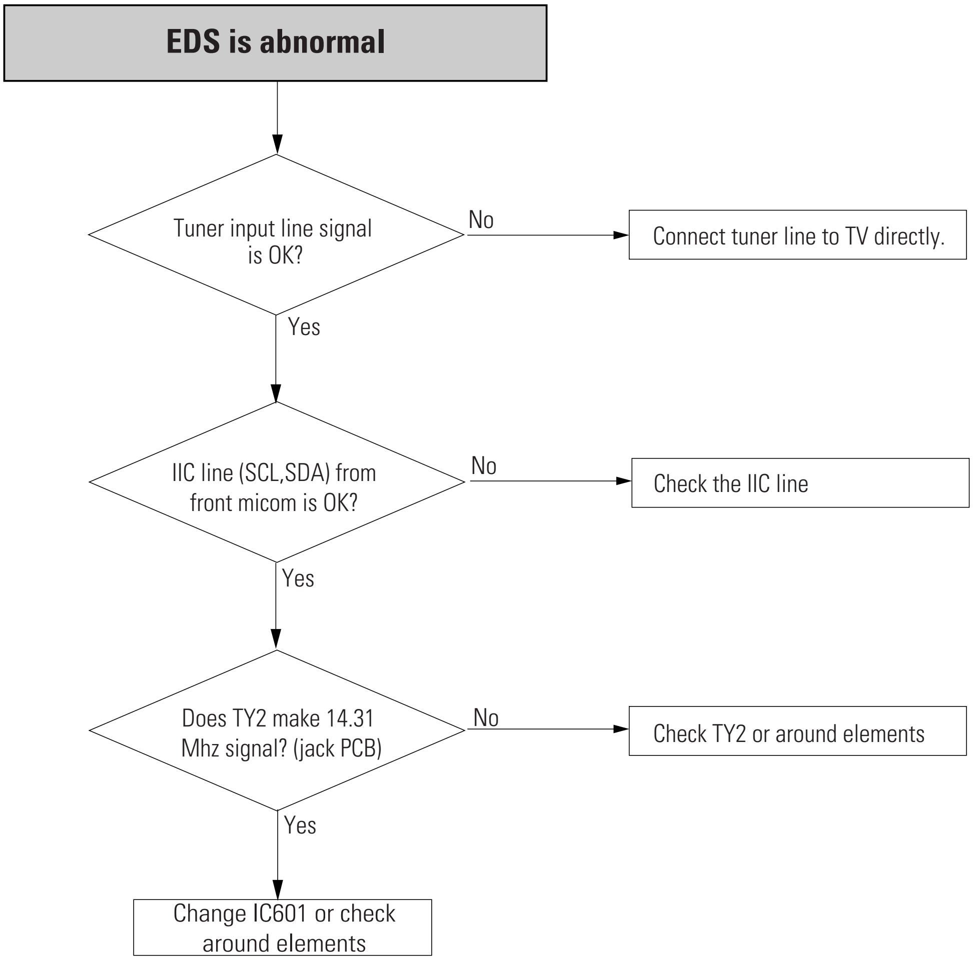


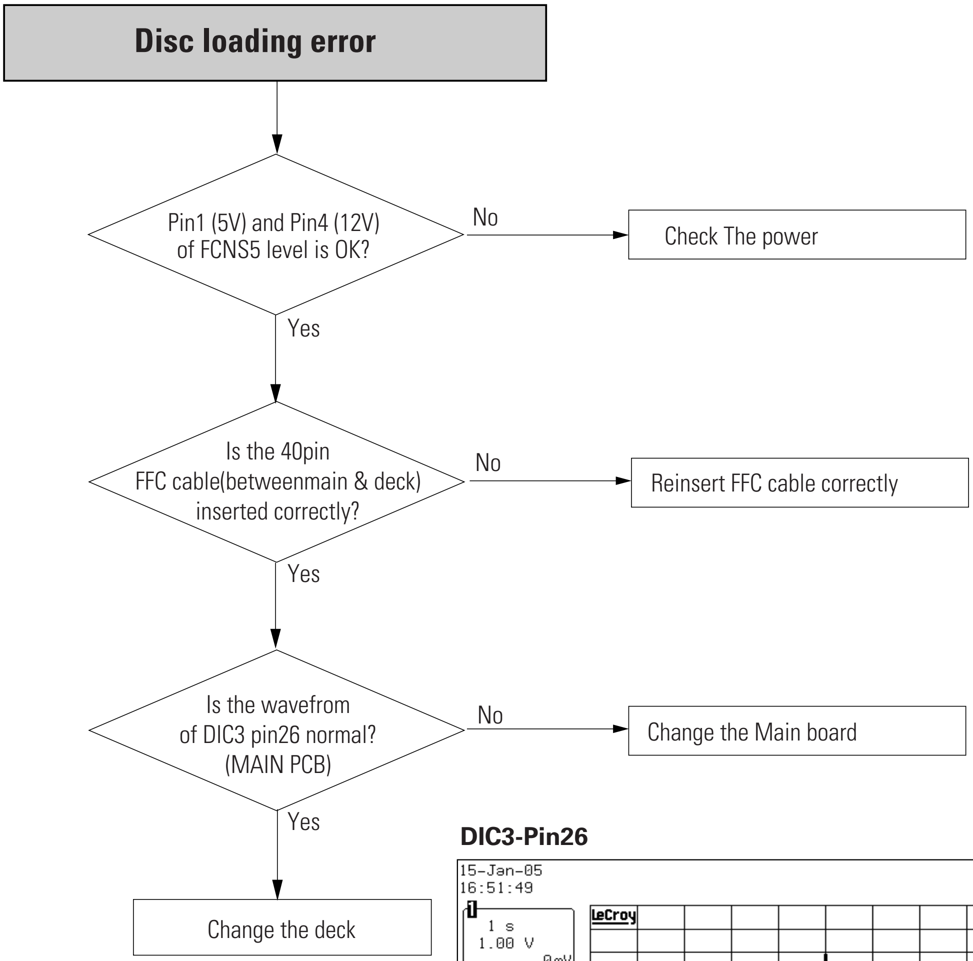

There is no Audio Output
Check the audio signal AR413 and AR437 (JACK PCB)
No
Check for Low state of Pin22 of the Front Micom IC601(JACK PCB)
Yes
Check for 5V on Pin 8 of AIC1 (MAIN PCB)
No
Check SMPS
Yes
Check the audio signal pin7 pin8 of AIC1 (MAIN PCB)
No
Replace Main PCB
Yes
Check digital clock and data pin1, 2, 3, 16 of AIC1 (MAIN PCB)
No
Replace MAIN PCB
Yes
Check the passive parts around Jack pin.

AUDIO DATA

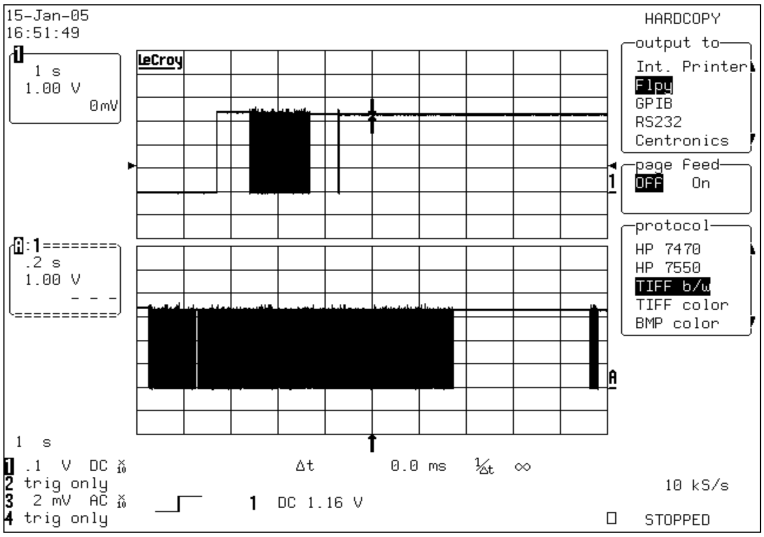


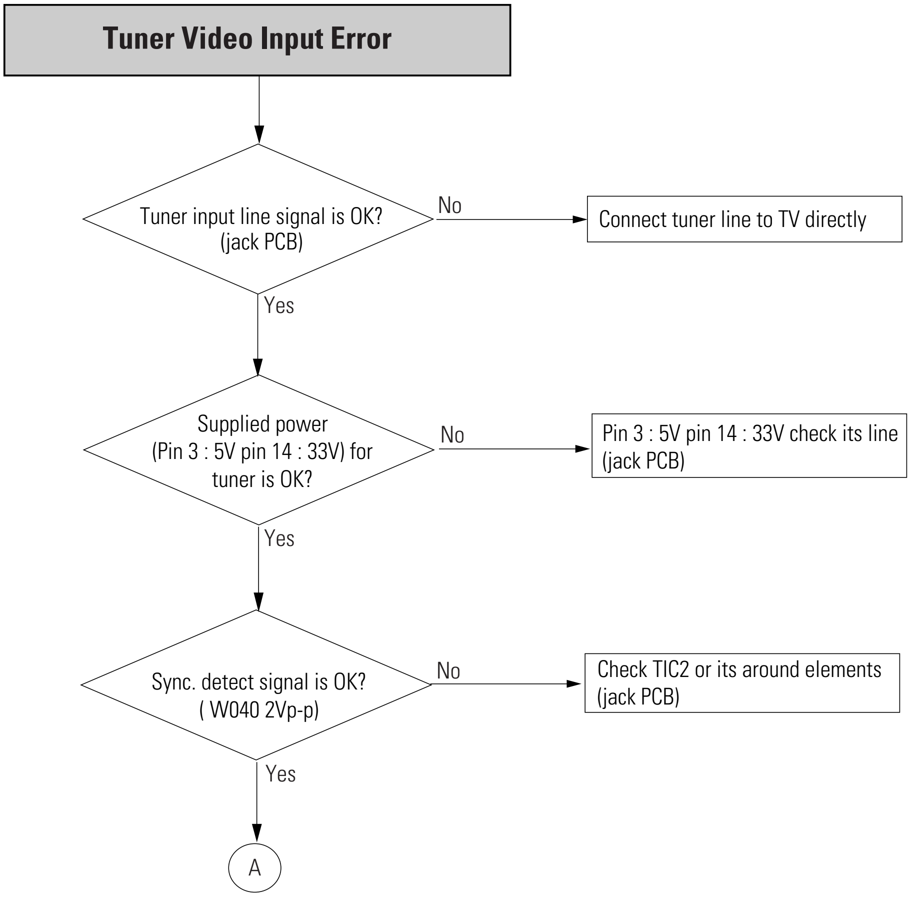
```
17-Jan-05                                              CHANNEL 1
11:05:17                                               Coupling
1                                                      DC50Ω
  1 μs                                                 Grounded
 1.00 V                                                DC1MΩ
      0mV                                              Grounded
                                                       AC1MΩ
                                                       V/div OFFset
                                                        NORMAL
                                                        ECL  TTL
                                                       Global BWL
                                                          OFF
                                                       20MHz 200MHz
                                                       Probe sensed
                                                       (x10     )
 1 μs      BWL
1 .1  V  DC x10            Δt      0.00 ns   1/Δt  ∞
2 trig only                                                4 GS/s
3 50 mV  AC x10                1 Line ANY
4 trig only         Neg          525/60/2:1           ☐   STOPPED
```

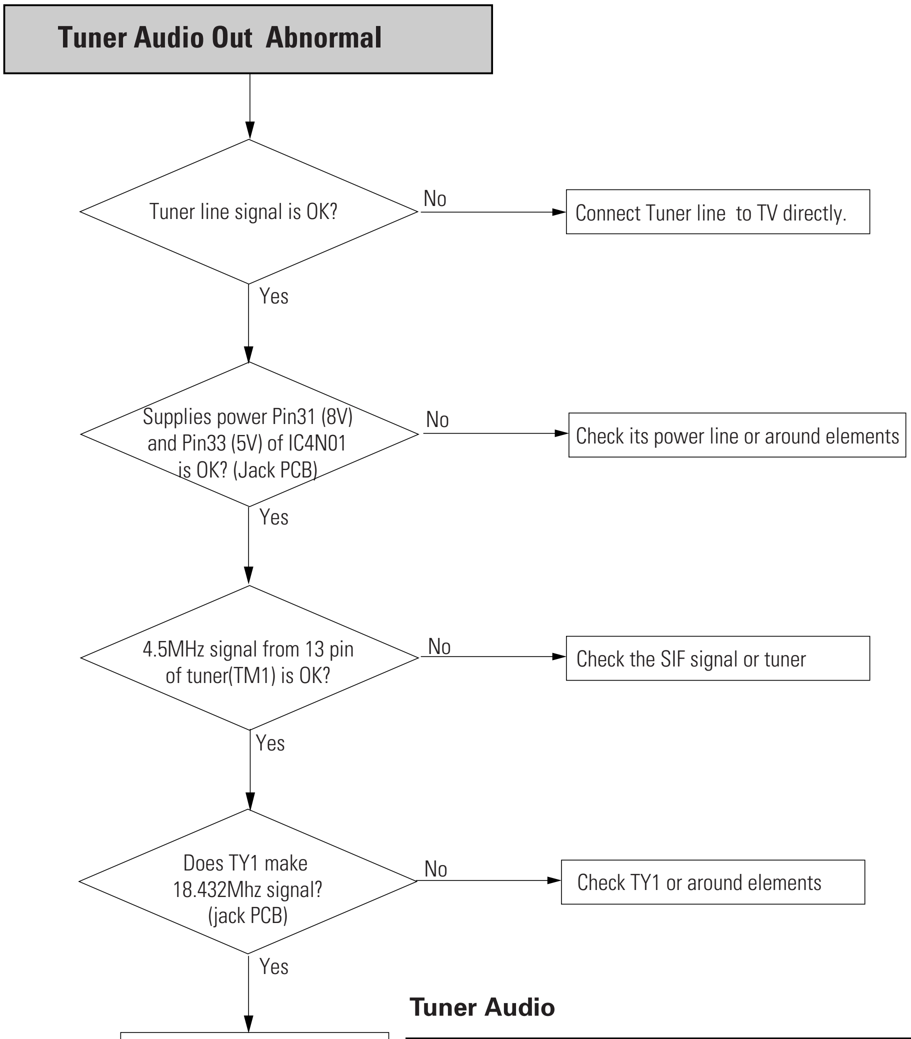

EDS is abnormal
Tuner input line signal is OK?
No
Connect tuner line to TV directly.
Yes
IIC line (SCL,SDA) from front micom is OK?
No
Check the IIC line
Yes
Does TY2 make 14.31 Mhz signal? (jack PCB)
No
Check TY2 or around elements
Yes
Change IC601 or check around elements


Disc loading error
Pin1 (5V) and Pin4 (12V) of FCNS5 level is OK?
No
Check The power
Yes
Is the 40pin FFC cable(betweenmain & deck) inserted correctly?
No
Reinsert FFC cable correctly
Yes
Is the wavefrom of DIC3 pin26 normal? (MAIN PCB)
No
Change the Main board
Yes
Change the deck

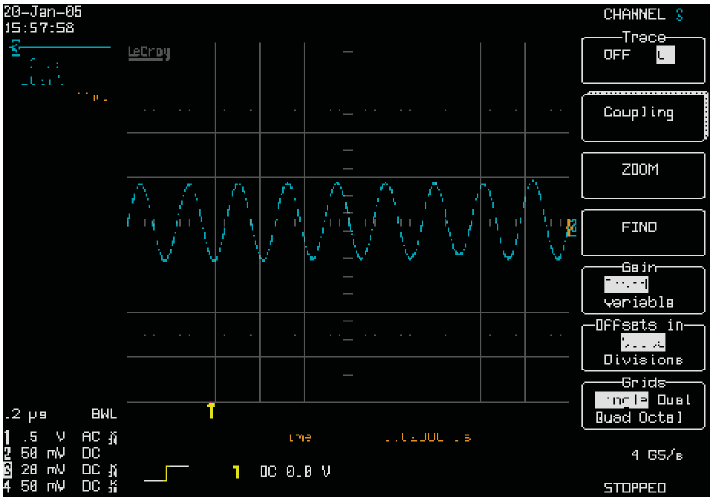
DIC3-Pin26

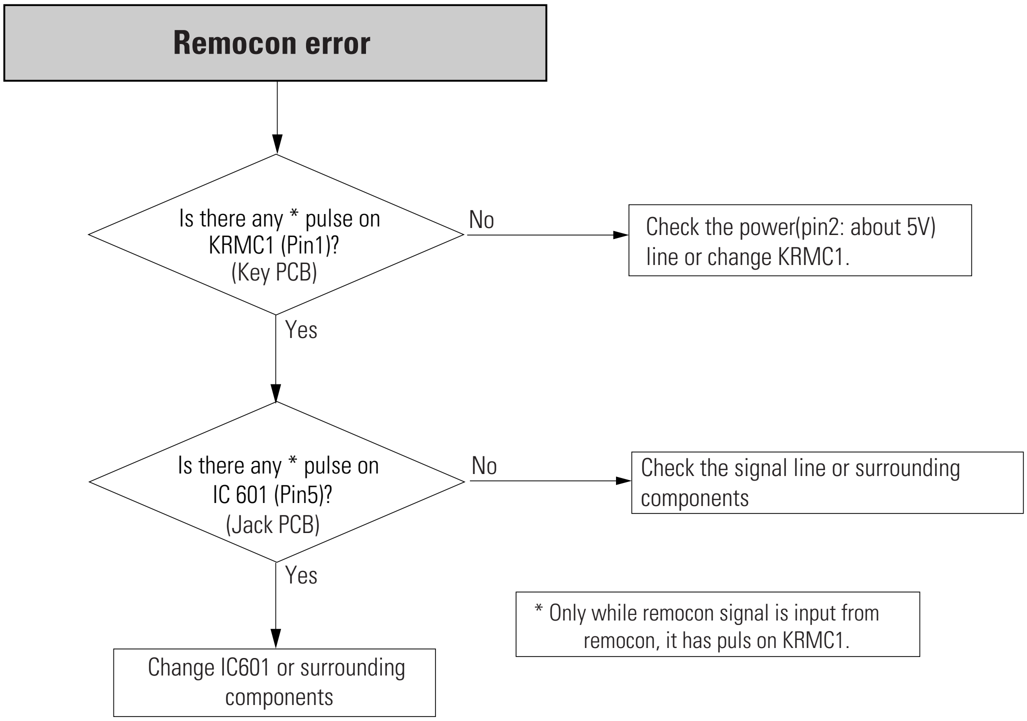

15-Jan-05
16:51:49
HARDCOPY
LeCroy
1
1 s
1.00 V
0mV
A:1
.2 s
1.00 V
output to
Int. Printer
Flpy
GPIB
RS232
Centronics
page Feed
OFF
On
protocol
HP 7470
HP 7550
TIFF b/w
TIFF color
BMP color
A
1 s
1 .1 V DC
2 trig only
3 2 mV AC
4 trig only
Δt
0.0 ms
1/Δt
∞
1
DC 1.16 V
10 kS/s
STOPPED


Tuner Video Input Error
Tuner input line signal is OK? (jack PCB)
No
Connect tuner line to TV directly
Yes
Supplied power (Pin 3 : 5V pin 14 : 33V) for tuner is OK?
No
Pin 3 : 5V pin 14 : 33V check its line (jack PCB)
Yes
Sync. detect signal is OK? (W040 2Vp-p)
No
Check TIC2 or its around elements (jack PCB)
Yes
A


Tuner Audio Out Abnormal
Tuner line signal is OK?
No
Connect Tuner line to TV directly.
Yes
Supplies power Pin31 (8V) and Pin33 (5V) of IC4N01 is OK? (Jack PCB)
No
Check its power line or around elements
Yes
4.5MHz signal from 13 pin of tuner(TM1) is OK?
No
Check the SIF signal or tuner
Yes
Does TY1 make 18.432Mhz signal? (jack PCB)
No
Check TY1 or around elements
Yes
If TIC1 is normal, refer to audio line in abnomal

Tuner Audio


20-Jan-05
15:57:58
LeCroy
CHANNEL
Trace
OFF
Coupling
ZOOM
FIND
Gain
variable
Offsets in
Divisions
Grids
Dual
Quad Octal
.2 μs
BWL
1 .5 V AC
2 50 mV DC
3 20 mV DC
4 50 mV DC
1 DC 0.0 V
4 GS/s
STOPPED


Remocon error
Is there any * pulse on KRMC1 (Pin1)? (Key PCB)
No
Check the power(pin2: about 5V) line or change KRMC1.
Yes
Is there any * pulse on IC 601 (Pin5)? (Jack PCB)
No
Check the signal line or surrounding components
Yes
Change IC601 or surrounding components

* Only while remocon signal is input from remocon, it has puls on KRMC1.

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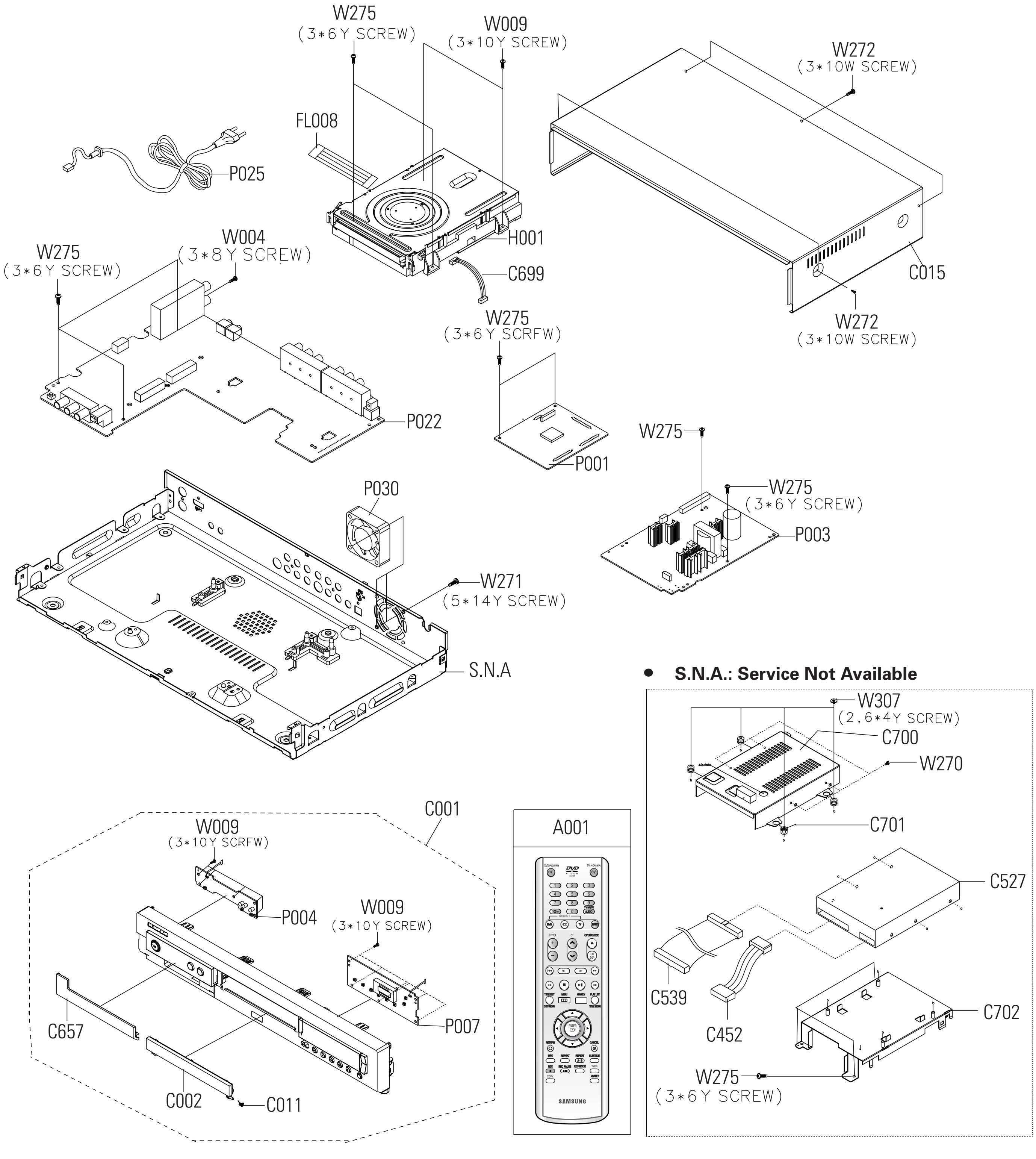
6. Exploded View and Parts List

6-1 Cabinet Assembly - 6-2

6-1 Cabinet Assembly


W275
(3*6Y SCREW)
W009
(3*10Y SCREW)
W272
(3*10W SCREW)
FL008
P025
H001
C699
C015
W275
(3*6Y SCREW)
W004
(3*8Y SCREW)
W275
(3*6Y SCRFW)
W272
(3*10W SCREW)
P022
W275
P001
P030
W275
(3*6Y SCREW)
P003
W271
(5*14Y SCREW)
S.N.A
W307
(2.6*4Y SCREW)
C700
W270
C001
A001
C701
W009
(3*10Y SCRFW)
C527
P004
W009
(3*10Y SCREW)
C539
C702
C452
C657
P007
W275
(3*6Y SCREW)
C002
C011
SAMSUNG

- **S.N.A.: Service Not Available**

Loc. No	Parts No.	Description ; Specification	Q ty	S.N.A	Remark
A001	AK59-00023L	REMOCON-ASSY;DVD-HR720/XAA,XAA,210*55*21	1	SA	
C001	AK97-01270Q	ASSY CABINET-FRONT;ASSY,DVD-HR72/XAA,05-	1	SA	
C002	AK64-01264A	DOOR-TRAY;DVD-HR720,HIPS V2,T2.5,H25,W15	1	SA	
C011	AK61-00137A	SPRING ETC-DOOR;DVD-R4000,COIL,,,,,,PI0.	1	SA	
C015	AK64-01263A	CABINET-TOP;DVD-HR720,PCM,T0.625,W427.8,	1	SA	
C452	AK39-00050A	LEAD CONNECTOR;LEAD CONNECTOR ASS,UL 100	1	SA	
C527	AK59-00042A	HDD;120G,SV1203E/OMD,512/SECTOR,3,	1	SA	
C539	AK39-00051A	WIRE HARNESS;CABLE ASS,2651#28 40COR,-,4	1	SA	
C657	AK64-01265N	DOOR-JACK;DVD-HR720,ABS HB,T2.5,H18,W66,	1	SA	
C699	AK39-00044A	LEAD CONNECTOR-ASSY;HS-030925-01,UL1007	1	SA	
C700	AK61-00336A	BRACKET-HDD/COVER;DVD-HR800,SECC US,T0.8	1	SA	
C701	AK73-00028A	RUBBER-HDD;DVD-HR800/XAA,BUTHYL 40Hs,10*	4	SA	
C702	AK61-00463A	BRACKET-HDD BOTTOM;DVD-HR720,SECC,T0.8,W	1	SA	
FL008	3809-001747	CABLE-FLAT;30V,80°…,150mm,40P,0.5mm,UL 2	1	SA	
H001	AK97-01211A	ASSY-ASSY LOADER DRIVE;-,SV-R250,ASSY LO	1	SA	
P001	AK92-00694A	ASSY PCB-MAIN;DVD-HR720,MAIN PCB ASSY	1	SA	
P003	AK92-00713A	ASSY PCB-SMPS;DVD-HR720,SMPS ASSY PCB	1	SA	
P004	AK92-00716A	ASSY PCB-KEY;SV-HR7500,HDD	1	SA	
P007	AK92-00662A	ASSY PCB-KEY;DVD-HR720 PAL,RIGHT	1	SA	
P022	AK92-00696A	ASSY PCB-JACK;DVD-HR720,JACK PCB ASSY	1	SA	
P025	AC39-10200N	CBF-POWER CORD;AT,US,EP2/Y,HOUSING(2P),1	1	SA	
P030	3103-001154	FAN-DC;DC 12.0V,110mA,2000rpm,0.388m^	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W009	6003-000276	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(YEL),SWC	13	SA	
W270	6001-000742	SCREW-MACHINE;PH,+,UNC6-32,L4.2,ZPC(WHT)	4	SA	
W271	6009-001411	SCREW-SPECIAL;TH,+,-,M5,L14,NI PLT,SWRCH	2	SA	
W272	6003-001464	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(WHT)	5	SA	
W275	6003-001561	SCREW-TAPTITE;BH,+,-,B,M3,L6,ZPC(YEL),SW	14	SA	
W307	6001-001868	SCREW-MACHINE;PWH,+,-,M2.6,L4,ZPC(YEL),S	4	SA	

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7. Electrical Parts List

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
P001	**AK92-00694A**	**ASSY PCB-MAIN;DVD-HR720,MAIN PCB ASSY**	**1**	**SA**	
AC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC101	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC104	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
AC105	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC2	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC7	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC816	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
AC818	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
AC820	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	
AC821	2203-001554	C-CER,CHIP;1.8nF,10%,50V,X7R,TP,1608	1	SA	
AC822	2402-001011	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	1	SA	
AC823	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	
AC824	2203-001554	C-CER,CHIP;1.8nF,10%,50V,X7R,TP,1608	1	SA	
AC831	2402-001011	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	1	SA	
AC891	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC892	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC908	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC912	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC913	2402-001011	C-AL,SMD;22uF,20%,16V,GP,TP,5.3x5.3x5.4	1	SA	
AC914	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC915	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
AC917	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
ADR001	2007-000033	R-CHIP;0ohm,5%,1/4W,TP,3216	1	SA	
AE1	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
AE2	2402-000202	C-AL,SMD;100uF,20%,10V,WT,TP,6.6x6.6x5.	1	SA	
AE3	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
AIC1	1002-001294	IC-D/A CONVERTER;PCM1742KE,24BIT,TSSOP,1	1	SA	
AIC2	1203-003180	IC-POSI.FIXED REG.;MM1565,SOP,7P,5x4.4mm	1	SA	
AIC3	1203-002178	IC-POSI.FIXED REG.;1563,SOP,7P,173MIL,PL	1	SA	
AIC81	1201-000163	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	1	SA	
AIC82	1201-000163	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	1	SA	
AIC9	1002-001387	IC-A/D CONVERTER;PCM1802,24BIT,SSOP,20P,	1	SA	
AR1	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR10	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR11	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR12	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR13	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR14	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR15	2007-000120	R-CHIP;680ohm,5%,1/10W,TP,1608	1	SA	
AR16	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR17	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR19	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR2	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR20	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR21	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR22	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR23	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR24	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
AR25	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR26	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR27	2007-000120	R-CHIP;680ohm,5%,1/10W,TP,1608	1	SA	
AR28	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
AR29	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR3	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
AR30	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR31	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR32	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR33	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR34	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
AR4	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR5	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR51	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR52	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR6	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR7	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
AR8	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
AR801	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR802	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR803	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR804	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	SA	
AR805	2007-000122	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	1	SA	
AR806	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR807	2007-000122	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	1	SA	
AR808	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	SA	
AR809	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	SA	
AR811	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	SA	
AR812	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	SA	
AR813	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR814	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AR881	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR882	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR894	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR895	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR9	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
ATAR1	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR2	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR3	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR4	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR5	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR6	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR7	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATAR8	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
ATCN1	3708-001935	CONNECTOR-FPC/FFC/PIC;40P,0.5mm,SMD-S,Sn	1	SA	
ATCN3	3711-005638	HEADER-BOARD TO CABLE;BOX,40P,2R,2.54mm,	1	SA	
C1	2203-000746	C-CER,CHIP;0.03NF,5%,50V,C0G,TP,1608	1	SA	
C10	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C11	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	

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Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
C12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C123	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
C124	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
C125	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C126	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C127	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C128	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C129	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C130	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C140	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C141	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C142	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C143	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C144	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C145	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C146	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C147	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C150	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C166	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
C167	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C168	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C169	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C171	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C173	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
C174	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
C177	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C178	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
C179	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C183	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C184	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C185	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C2	2203-000746	C-CER,CHIP;0.03NF,5%,50V,C0G,TP,1608	1	SA	
C214	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
C215	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C217	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C218	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C219	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
C220	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C222	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C223	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C224	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C227	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C228	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C230	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C231	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C232	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C7	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C8	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C9	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
CA1	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
CA2	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
CC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
CN1	3710-002075	CONNECTOR-SOCKET;30P,2R,2MM,SMD,SnPb,BLK	1	SA	
CN2	3710-002075	CONNECTOR-SOCKET;30P,2R,2MM,SMD,SnPb,BLK	1	SA	
CN3	3711-005595	CONNECTOR-SOCKET;12P,2R,2MM,SMD-S,-,BLK	1	SA	
CR1	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
CR2	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
CR3	2007-000083	R-CHIP;3Kohm,5%,1/10W,TP,1608	1	SA	
CR4	2007-001157	R-CHIP;750ohm,5%,1/10W,TP,1608	1	SA	
CR5	2007-001157	R-CHIP;750ohm,5%,1/10W,TP,1608	1	SA	
CR6	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
CR7	2007-001157	R-CHIP;750ohm,5%,1/10W,TP,1608	1	SA	
DC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC10	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC100	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC11	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC14	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC16	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC17	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC18	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC19	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC2	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC20	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC22	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC23	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC24	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC25	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC26	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC27	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
DC28	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC29	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC30	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC31	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC32	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC33	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC34	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC35	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC36	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC37	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC38	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC39	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC7	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC8	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DC9	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
DE1	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
DE3	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
DE4	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
DE6	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
DIC2	0801-002522	IC-CMOS LOGIC;74VHC541,BUFFER/LINE DRIVE	1	SA	
DIC6	0802-001115	IC-CMOS LOGIC;74ALVCH16373,D LATCH,TSSOP	1	SA	
DIC7	0801-002587	IC-CMOS LOGIC;74LVX541,8BIT BUFFER/DRIVE	1	SA	
DIC8	1103-001134	IC-EEPROM;24C040,512x8,SOP,8P,5.13x3.95m	1	SA	
DNR1	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
DNR2	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
DNR3	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
DNR4	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
DR1	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
DR100	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR104	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR105	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR112	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR113	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
DR12	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR13	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR14	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR15	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR16	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR17	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR2	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR21	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR22	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR28	2007-008199	R-CHIP;1.18Kohm,1%,1/10W,TP,1608	1	SA	
DR3	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
DR31	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR37	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR4	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR45	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR46	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR47	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR56	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR57	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR58	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR59	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR6	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR60	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR61	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR64	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR65	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR66	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
DR67	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR68	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR69	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
DR7	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DR70	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR72	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR73	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR74	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
DR8	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
DR84	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR85	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR86	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR87	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
DR9	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
DRA01	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DRA02	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DRA03	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
DRA04	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
FB23	2007-000029	R-CHIP;0ohm,5%,1/8W,TP,2012	1	SA	
GC4	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC5	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC6	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GR1	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	SA	
HDR1	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
HDR2	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
IC1	1205-002510	IC-CODEC;DMN-8652,BGA,388P,35x35mm,PLAS	1	SA	
IRR1	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
PC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC10	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC11	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PC12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC14	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC16	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PC17	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC18	2203-001607	C-CER,CHIP;0.22nF,5%,50V,NP0,-,1608	1	SA	
PC19	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC21	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
PC3	2203-000815	C-CER,CHIP;0.033NF,5%,50V,C0G,TP,1608	1	SA	
PC4	2203-000815	C-CER,CHIP;0.033NF,5%,50V,C0G,TP,1608	1	SA	
PC5	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PC6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC7	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PC8	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC9	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
PE1	2402-000007	C-AL,SMD;22uF,20%,6.3V,GP,TP,4.3x4.3x5.	1	SA	
PE3	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
PE4	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
PE5	2402-000170	C-AL,SMD;1uF,20%,50V,GP,TP,4.3x4.3x5.4,	1	SA	
PHC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PIC1	1205-001988	IC-DATA COMM./GEN.;TSB41AB1-PAP,QFP,64P,	1	SA	
PL2	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
PL3	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
PL4	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
PR1	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
PR10	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
PR12	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR13	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR14	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR15	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR16	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR17	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR18	2007-000965	R-CHIP;5.1Kohm,5%,1/10W,TP,1608	1	SA	
PR19	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
PR2	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
PR20	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
PR21	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
PR22	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
PR23	2007-001056	R-CHIP;6.2Kohm,5%,1/10W,TP,1608	1	SA	
PR24	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
PR4	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
PR5	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
PR59	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	SA	
PR60	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
PR9	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
PRA1	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
PRA2	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
PY1	2801-004021	CRYSTAL-SMD;24.576MHz,20ppm,28-AAN,12pF,	1	SA	
R1	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R213	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R214	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R215	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R216	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R217	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R218	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R219	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R220	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R221	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R222	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R223	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R224	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R225	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R226	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R227	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R228	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R229	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R230	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R232	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R234	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R237	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R238	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R239	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R240	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R241	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R242	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R243	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R246	2007-001044	R-CHIP;56ohm,5%,1/10W,TP,1608	1	SA	
R247	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R248	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R411	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
R67	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R68	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R69	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
R70	2007-001014	R-CHIP;51OHM,5%,1/10W,TP,1608	1	SA	
RC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC2	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC5	2203-001683	C-CER,CHIP;0.068nF,5%,50V,NP0,TP,1608	1	SA	
RC6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RE1	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
RE2	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
RE3	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
RE4	2402-001237	C-AL,SMD;330uF,°æ20%,6.3V,-,REEL,6.3X7.	1	SA	
RIC1	1203-003182	IC-POSI.FIXED REG.;LP3965,TO-263,5P,10.1	1	SA	
RIC2	1203-002612	IC-POSI.ADJUST REG.;3966,TO-263,5P,10.16	1	SA	
RL4	2007-000033	R-CHIP;0ohm,5%,1/4W,TP,3216	1	SA	
RP1	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP10	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP12	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP14	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP15	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP17	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP18	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP19	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP20	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP21	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
RP22	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
RP23	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
RP24	2011-000002	R-NET;22OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
RP25	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP26	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP27	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP28	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP29	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP3	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP30	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP31	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP34	2011-001194	R-NET;51ohm,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP5	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RP7	2011-000686	R-NET;56OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
RR3	2007-000962	R-CHIP;5.1Kohm,1%,1/10W,TP,1608	1	SA	
RR4	2007-000300	R-CHIP;10Kohm,5%,1/8W,TP,2012	1	SA	
TC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC11	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC14	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC17	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC2	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC21	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC24	2203-002793	C-CER,CHIP;1000nF,+80-20%,25V,Y5V,2012	1	SA	
TC25	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC31	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC34	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC38	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC41	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC48	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC55	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC61	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC67	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC74	2203-000646	C-CER,CHIP;0.024NF,5%,50V,C0G,TP,1608	1	SA	
TC75	2203-000646	C-CER,CHIP;0.024NF,5%,50V,C0G,TP,1608	1	SA	
TC76	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC78	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
TC8	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC90	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC91	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC92	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TE2	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
TE3	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
TE4	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
TE5	2402-000204	C-AL,SMD;10UF,20%,16V,WT,TP,4.3X4.3X5.4	1	SA	
TIC1	1204-002235	IC-PAL/NTSC DECODER;TVP5146PFP,PQFP,80P,	1	SA	
TIC2	1203-002577	IC-POSI.FIXED REG.;MM1561J,SOP,7P,173MIL	1	SA	
TNR50	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
TNR54	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
TNR60	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
TNR66	2011-000515	R-NET;4.7Kohm,5%,1/16W,L,CHIP,8P,TP,	1	SA	
TR28	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
TR29	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
TR30	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR33	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
TR34	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
TR36	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR37	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR40	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
TR43	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
TR44	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
TR69	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR70	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR711	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR72	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
TR73	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
TR74	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	SA	
TR75	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
TX1	2801-004183	CRYSTAL-SMD;14.31818MHZ,30PPM,28-AAN,16P	1	SA	
U23	1105-001580	IC-DRAM;HYB25D512160,32Mx16Bit,TSOPII,	1	SA	
U24	1105-001580	IC-DRAM;HYB25D512160,32Mx16Bit,TSOPII,	1	SA	
U25	1203-003038	IC-POSI.ADJUST REG.;LP2995,SO,8P,4.9x3.9	1	SA	
U34	0401-000008	DIODE-SWITCHING;DAN217,80V,100MA,SOT-23,	1	SA	
Y1	2801-004182	CRYSTAL-SMD;13.5MHZ,10PPM,28-AAN,24PF,60	1	SA	
P003	**AK92-00713A**	**ASSY PCB-SMPS;DVD-HR720,SMPS ASSY PCB**	**1**	**SA**	
C702	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	1	SA	
CON6	3711-003942	HEADER-BOARD TO CABLE;BOX,2P,1R,2mm,STRA	1	SA	
D701	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
FCON1	3708-001802	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,STRAIGH	1	SA	
L701	2701-000002	INDUCTOR-AXIAL;100UH,10%,4298	1	SA	
PACT1	2301-001719	C-FILM,LEAD;100nF,10%,275V,TP,17.5*6*12m	1	SA	
PACT2	2301-001719	C-FILM,LEAD;100nF,10%,275V,TP,17.5*6*12m	1	SA	
PADT1	0402-000550	DIODE-BRIDGE;D2SBA60,600V,1.5A,-	1	SC	
PAFT1	3601-000244	FUSE-CARTRIDGE;250V,2A,SLOW-BLOW,GLASS,5	1	SC	
PALT1	AC29-00002A	FILTER LINE NOISE;-,30mH,-,-,BLF-2116	1	SA	
PALT2	AC29-00002A	FILTER LINE NOISE;-,30mH,-,-,BLF-2116	1	SA	
PART1	2002-000121	R-COMPOSITION;1Mohm,10%,1/2W,AA,TP,3.5x9	1	SA	
PAVV1	1405-000186	VARISTOR;470V,2500A,17.5x7.5mm,TP	1	SA	
PAVV2	1405-001026	VARISTOR;470V,600A,9x7mm,TP	1	SA	
PAWT1	3711-000203	HEADER-BOARD TO CABLE;1WALL,2P/3P,1R,7.9	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
PBBU1	AC27-92001M	COIL-INDUCTOR;RH3.5X6.5RS,BEAD(RADIAL),-	1	SC	
PBCU2	2201-002044	C-CERAMIC,DISC;0.1NF,10%,400V,Y5P,TP,8.5	1	SA	
PBCU3	2201-000987	C-CERAMIC,DISC;2.2NF,20%,400V,Y5U,BK,12.	1	SA	
PBIZ1	0604-001028	PHOTO-COUPLER;TR,50-600%,250mW,DIP-4,ST	1	SA	
PBIZ2	0604-001028	PHOTO-COUPLER;TR,50-600%,250mW,DIP-4,ST	1	SA	
PCN1	3710-002036	SOCKET-BOARD TO BOARD;12P,1R,2.5mm,STRAI	2	SA	
PCNS5	3711-004379	HEADER-BOARD TO CABLE;BOX,4P,1R,2MM,STRA	1	SA	
PCNS6	3711-000240	HEADER-BOARD TO CABLE;1WALL,4P,1R,3.96MM	1	SA	
PDCZ1	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	1	SA	
PDCZ2	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	1	SA	
PDDZ1	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
PDDZ2	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
PDRZ1	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PDRZ2	2001-000598	R-CARBON;3.3OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PDRZ3	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PDRZ4	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PDRZ5	2001-000598	R-CARBON;3.3OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PDRZ6	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFCD1	2307-000103	C-FILM,LEAD-PCF;100nF,5%,50V,TP,-,5mm	1	SA	
PFCF1	2307-000103	C-FILM,LEAD-PCF;100nF,5%,50V,TP,-,5mm	1	SA	
PFCZ1	2307-000104	C-FILM,LEAD-PCF;10nF,5%,50V,TP,-,5mm	1	SA	
PFCZ2	2401-003122	C-AL;4.7uF,20%,50V,LL,TP,5X7,5	1	SA	
PFCZ3	2307-000104	C-FILM,LEAD-PCF;10nF,5%,50V,TP,-,5mm	1	SA	
PFCZ4	2401-003122	C-AL;4.7uF,20%,50V,LL,TP,5X7,5	1	SA	
PFID1	AC14-12006D	IC;KA431Z,TO-92,TAPING	1	SA	
PFIF1	AC14-12006D	IC;KA431Z,TO-92,TAPING	1	SA	
PFRD1	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRD2	2001-000302	R-CARBON;10OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRD3	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRD4	2004-000459	R-METAL;2.2Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	SA	
PFRF1	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRF2	2001-000221	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFRF3	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRF4	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFRF5	2004-000869	R-METAL;3Kohm,1%,1/8W,AA,TP,1.8x3.2mm	1	SA	
PFRF6	2004-000459	R-METAL;2.2Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	SA	
PFRF7	2004-000869	R-METAL;3Kohm,1%,1/8W,AA,TP,1.8x3.2mm	1	SA	
PFRF8	2004-000869	R-METAL;3Kohm,1%,1/8W,AA,TP,1.8x3.2mm	1	SA	
PFRF9	2003-000148	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	1	SC	
PFRI1	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRI2	2001-000221	R-CARBON;1.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFRJ1	2001-000006	R-CARBON;2.4KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFRZ1	2001-000527	R-CARBON;22OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRZ2	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFRZ3	2001-000527	R-CARBON;22OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PFRZ4	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PFZZ1	0403-001318	DIODE-ZENER;MTZJ4.3B,4.17-4.43V,500MW,DO	1	SA	
PFZZ2	0403-001318	DIODE-ZENER;MTZJ4.3B,4.17-4.43V,500MW,DO	1	SA	
PLRZ1	1404-001361	THERMISTOR-NTC;3ohm,4A,-,35mW/C,-,9,TP	1	SA	
PLRZ11	2003-000105	R-METAL OXIDE;0.33ohm,5%,2W,AD,TP,6x16mm	1	SA	
PLRZ2	2003-000105	R-METAL OXIDE;0.33ohm,5%,2W,AD,TP,6x16mm	1	SA	
PPCD1	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	1	SA	
PPCD2	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCD3	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCD4	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	1	SA	

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Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
PPCF1	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	1	SA	
PPCF2	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCF3	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	1	SA	
PPCF4	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCF5	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCF6	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCF7	2401-003480	C-AL;1000UF,20%,10V,LZ,TP,10X16MM,5	1	SA	
PPCF8	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCF9	2401-002063	C-AL;330uF,20%,10V,GP,TP,6.3x11,5mm	1	SA	
PPCI2	2401-001126	C-AL;330uF,20%,25V,WT,TP,10x12.5,5	1	SA	
PPCI3	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	1	SA	
PPCI4	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	1	SA	
PPCI5	2401-000302	C-AL;100uF,20%,25V,GP,TP,6.3x11,5	1	SA	
PPCJ1	2401-001126	C-AL;330uF,20%,25V,WT,TP,10x12.5,5	1	SA	
PPCO1	2401-000385	C-AL;10uF,20%,100V,GP,TP,6.3x11,5	1	SC	
PPCO2	2401-000385	C-AL;10uF,20%,100V,GP,TP,6.3x11,5	1	SC	
PPCO3	2401-000385	C-AL;10uF,20%,100V,GP,TP,6.3x11,5	1	SC	
PPDD1	0402-001643	DIODE-RECTIFIER;MBRF10A0,100V,10A,ITO-22	1	SA	
PPDD2	0402-001643	DIODE-RECTIFIER;MBRF10A0,100V,10A,ITO-22	1	SA	
PPDF1	0402-001587	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	1	SA	
PPDF2	0402-001587	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	1	SA	
PPDF3	0402-001587	DIODE-RECTIFIER;SFAF504G,200V,5A,TO-220A	1	SA	
PPDI2	0402-001194	DIODE-RECTIFIER;SHG2D,200V,2A,-,TP	1	SA	
PPDJ1	0402-001194	DIODE-RECTIFIER;SHG2D,200V,2A,-,TP	1	SA	
PPDO1	0402-000012	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	1	SA	
PPIF2	1203-001589	IC-POSI.FIXED REG.;278R05,TO-220F,4P,-,P	1	SA	
PPIF3	1203-001589	IC-POSI.FIXED REG.;278R05,TO-220F,4P,-,P	1	SA	
PPIF4	1203-001589	IC-POSI.FIXED REG.;278R05,TO-220F,4P,-,P	1	SA	
PPII1	AC14-12006N	IC-VOLT REGU;KA78R12,SIP,STICK	1	SA	
PPII2	1203-002183	IC-SWITCH VOL. REG.;278R12,TO-220F-4L,4P	1	SA	
PPII3	1203-002183	IC-SWITCH VOL. REG.;278R12,TO-220F-4L,4P	1	SA	
PPLD1	AH27-00039A	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	1	SA	
PPLF1	AH27-00039A	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	1	SA	
PPLF2	AH27-00039A	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	1	SA	
PPLF3	AH27-00039A	COIL CHOKE;DR CHOKE(8*6),DVD-R2000,22uH,	1	SA	
PPQD1	0505-001565	FET-SILICON;GFP50N03,N,30V,50A,20MOHM,62	1	SA	
PPRD1	2003-000148	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	1	SC	
PPRD2	2003-000148	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	1	SC	
PPRD3	2003-000148	R-METAL OXIDE;100ohm,5%,2W,AE,TP,6x16mm	1	SC	
PPRO1	2001-000062	R-CARBON;470OHM,5%,1/4W,AA,TP,2.4X6.4MM	1	SA	
PPZO1	0403-000390	DIODE-ZENER;UZP33B,31.4-34.6V,1000MW,DO-	1	SA	
PQIZ1	1203-002805	IC-PWM CONTROLLER;ICE2BS01,PDIP,8P,9.52X	1	SA	
PQIZ2	1203-002805	IC-PWM CONTROLLER;ICE2BS01,PDIP,8P,9.52X	1	SA	
PQQX1	0505-001729	FET-SILICON;SPA04N60C3,N,600V,4.5A,0.85O	1	SA	
PQQX2	0505-001729	FET-SILICON;SPA04N60C3,N,600V,4.5A,0.85O	1	SA	
PQTZ1	AC26-00014D	TRANS SWITCHING;EE2722,HDD COMBO,-,FREE,	1	SA	
PQTZ2	AC26-00014E	TRANS SWITCHING;EER3126,HDD COMBO,-,FREE	1	SA	
PRCU1	2401-003863	C-AL;220uF,20%,200V,GP,BK,22x25mm,1	1	SA	
PSCZ1	2305-001029	C-FILM,LEAD-PEF;10nF,10%,630V,TP,12x9x12	1	SA	
PSCZ2	2201-000129	C-CERAMIC,DISC;0.1nF,10%,1000V,Y5P,-,7x4	1	SA	
PSCZ3	2305-001029	C-FILM,LEAD-PEF;10nF,10%,630V,TP,12x9x12	1	SA	
PSCZ4	2201-000129	C-CERAMIC,DISC;0.1nF,10%,1000V,Y5P,-,7x4	1	SA	
PSDZ1	0402-000012	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	1	SA	
PSDZ2	0402-000012	DIODE-RECTIFIER;UF4007,1KV,1A,DO-41,TP	1	SA	
PSRZ1	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	1	SA	
PSRZ2	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	1	SA	
PSRZ3	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	1	SA	
PSRZ4	2003-000994	R-METAL OXIDE(S);33Kohm,5%,2W,AF,TP,3.9x	1	SA	
PVCL1	2401-002608	C-AL;33uF,20%,35V,GP,TP,5x11,5	1	SA	
PVCL2	2401-002608	C-AL;33uF,20%,35V,GP,TP,5x11,5	1	SA	
PVDL1	0402-001195	DIODE-RECTIFIER;F1T4,400V,1A,DO-204AC,TP	1	SA	
PVDL2	0402-001195	DIODE-RECTIFIER;F1T4,400V,1A,DO-204AC,TP	1	SA	
PVRL1	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL2	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL3	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL4	2001-000666	R-CARBON;33OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PVRL5	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL6	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL7	2001-000548	R-CARBON;270KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
PVRL8	2001-001352	R-CARBON;62OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
PVZL1	0403-000713	DIODE-ZENER;MTZJ20B,18.63-17.7V,500MW,DO	1	SA	
PVZL2	0403-000713	DIODE-ZENER;MTZJ20B,18.63-17.7V,500MW,DO	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	1	SA	
P004	**AK92-00716A**	**ASSY PCB-KEY;SV-HR7500,HDD**	**1**	**SA**	
FL286	3809-001667	FFC CABLE-FLAT;30V,80C,70mm,10P,1.25mm,U	1	SA	
HC1	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
HC2	2401-003221	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	1	SA	
HD1	0601-001928	LED;ROUND,BLUE,3mm,465nm,3.6x3.8mm	1	SA	
HD2	0601-000402	LED;ROUND,YEL,3MM,585NM,-	1	SA	
HD3	0601-000402	LED;ROUND,YEL,3MM,585NM,-	1	SA	
HQ1	0504-000118	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	1	SA	
HQ2	0504-000118	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	1	SA	
HQ3	0504-000118	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	1	SA	
HR1	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
HR2	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR3	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR4	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR5	2001-000472	R-CARBON;2.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
HR6	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
HSW1	3404-001182	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	1	SA	
HSW2	3404-001182	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	1	SA	
HSW3	3404-001182	SWITCH-TACT;DC12V,50MA,100GF,6.0X6.0X5.0	1	SA	
KCON2	3708-001803	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,ANGLE,T	1	SA	
P007	**AK92-00662A**	**ASSY PCB-KEY;DVD-HR720 PAL,RIGHT**	**1**	**SA**	
IC701	1003-001561	IC-LED DRIVER;PT6961,SOP,32P,300MIL,-,40	1	SA	
D702	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	

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D703	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
D704	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
D705	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
DT701	AK07-00035A	LED DISPLAY-OVAL TYPE;BCD-9036A,DVD-HR72	1	SA	
FL286	3809-001667	FFC CABLE-FLAT;30V,80C,70mm,10P,1.25mm,U	1	SA	
HC10	2401-003221	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	1	SA	
HC11	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
HC12	2202-000173	C-CERAMIC,MLC-AXIAL;1nF,10%,50V,Y5P,-,1.	1	SA	
HC13	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	1	SA	
HC14	2401-001168	C-AL;33uF,20%,16V,GP,TP,6.3x5,2.5	1	SA	
HC15	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	1	SA	
HC16	2401-003221	C-AL;100uF,20%,16V,GP,TP,8X5,2.5	1	SA	
HC17	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
HD10	0601-001587	LED;ROUND,RED,3.1mm,635nm,3.8x5.2m	1	SA	
HR20	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR21	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR22	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR23	2001-000837	R-CARBON;51KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR24	2001-000515	R-CARBON;220OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR25	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
HR26	2001-000273	R-CARBON;100KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
KCON1	3708-001803	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,ANGLE,T	1	SA	
KRMC1	0609-001189	MODULE REMOCON;HORIZONTAL,16.4MM,TR	1	SC	
L701	2701-000002	INDUCTOR-AXIAL;100UH,10%,4298	1	SA	
L702	2701-000002	INDUCTOR-AXIAL;100UH,10%,4298	1	SA	
Q702	0504-000118	TR-DIGITAL;KSR1003,NPN,300MW,22K/22K,TO-	1	SA	
SW701A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW702A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW703A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW704A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW705A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW706A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW707A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW708A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
SW709A	3404-000165	SWITCH-TACT;12V,50mA,160gf,6x6mm,SPST	1	SA	
P022	**AK92-00696A**	**ASSY PCB-JACK;DVD-HR720,JACK PCB ASSY**	**1**	**SA**	
AC100	2203-000998	C-CER,CHIP;0.047NF,5%,50V,C0G,TP,1608	1	SA	
AC101	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC16	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
AC17	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
AC201	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC202	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC203	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC405	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC407	2203-000125	C-CER,CHIP;1.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC408	2203-000125	C-CER,CHIP;1.2nF,10%,50V,X7R,TP,1608,-	1	SA	
AC409	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
AC410	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
AC413	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AC702	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	
AC705	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	
AC714	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	
AC715	2203-000783	C-CER,CHIP;0.33NF,5%,50V,C0G,TP,1608	1	SA	

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ACC10	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
ACC2	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
ACC3	2203-000315	C-CER,CHIP;0.12NF,5%,50V,C0G,TP,1608	1	SA	
AD1	0407-000114	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	SA	
AD2	0407-000114	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	SA	
AD3	0407-000114	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	SA	
AD6	0402-000165	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	1	SA	
AE100	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
AE101	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	1	SA	
AE105	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE31	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	1	SA	
AE404	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
AE41	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE412	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
AE42	2401-000918	C-AL;22uF,20%,16V,GP,-,6.3x7,5	1	SA	
AE46	2401-000918	C-AL;22uF,20%,16V,GP,-,6.3x7,5	1	SA	
AE47	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE701	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE702	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE705	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE712	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE714	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AE715	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
AIC3	AH14-10004R	IC;M74HCU04,SOP,TAPE 14P	1	SA	
AIC4	1201-000163	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	1	SA	
AIC5	1201-000163	IC-OP AMP;4560,SOP,8P,173MIL,DUAL,100V/m	1	SA	
AL1	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AMC01	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
AME01	2401-002095	C-AL;47uF,20%,25V,GP,TP,6.3x5,5	1	SA	
AQ1	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	1	SA	
AQ3	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	1	SA	
AQ4	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	1	SA	
AQ5	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	1	SA	
AQ51	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	1	SA	
AQ52	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	1	SA	
AQ6	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	1	SA	
AQ7	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	1	SA	
AR100	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR101	2007-000077	R-CHIP;470ohm,5%,1/10W,TP,1608	1	SA	
AR105	2007-000119	R-CHIP;560ohm,5%,1/10W,TP,1608	1	SA	
AR106	2007-000119	R-CHIP;560ohm,5%,1/10W,TP,1608	1	SA	
AR120	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR121	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR123	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR124	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR125	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR126	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR127	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR128	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR202	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
AR203	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR204	2007-000076	R-CHIP;330ohm,5%,1/10W,TP,1608	1	SA	
AR26	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
AR4	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR40	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
AR403	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR407	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR409	2007-000092	R-CHIP;15Kohm,5%,1/10W,TP,1608	1	SA	
AR410	2007-000092	R-CHIP;15Kohm,5%,1/10W,TP,1608	1	SA	
AR411	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR412	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR413	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR414	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR415	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR420	2007-000122	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	1	SA	
AR421	2007-001179	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	1	SA	
AR460	2007-000122	R-CHIP;1.2Kohm,5%,1/10W,TP,1608	1	SA	
AR461	2007-001179	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	1	SA	
AR471	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR472	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR473	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR474	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR475	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
AR5	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
AR600	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
AR601	2001-000449	R-CARBON;2.2KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
AR702	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR705	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR714	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR715	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
AR722	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
AR725	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
AR734	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
AR735	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
AR740	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
ASQ01	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	1	SA	
ASQ02	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	1	SA	
ASQ03	0504-000156	TR-DIGITAL;KSR2103,PNP,200MW,22K/22K,SOT	1	SA	
ASQ04	0504-000128	TR-DIGITAL;-,NPN,200MW,22K/22K,SOT-23,TP	1	SA	
ASR01	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
ASR02	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
AVIN2	3722-001943	JACK-PIN;3P,8.3PI,NI,BLK,-	1	SA	
AVJ1	3722-002289	JACK-PIN;6P+1P(VHS),SN/NI,RED/WHT/YELx2	1	SA	
AVJ2	3722-002111	JACK-PIN;6P+1P,SN/NI,RED/WHT/YEL/BLK,AN	1	SA	
AVJ5	3707-001070	CONNECTOR-OPTICAL;PLUG,GP1FA550TZ,6dB,2.	1	SA	
BD01	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD02	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD03	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD04	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD05	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD06	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD07	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD08	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD09	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD10	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD11	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD12	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD13	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD14	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD15	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
BD16	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD17	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD18	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD19	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
BD23	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
BD24	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
BD25	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
BD26	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
C1	2401-000455	C-AL;10uF,20%,35V,GP,TP,4x7mm,5mm	1	SA	
C2	2401-000455	C-AL;10uF,20%,35V,GP,TP,4x7mm,5mm	1	SA	
C216	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C220	2203-005171	C-CER,CHIP;1000nF,10%,16V,X7R,2012	1	SA	
C222	2203-000062	C-CER,CHIP;47nF,+80-20%,50V,Y5V,TP,1608	1	SA	
C3	2401-001249	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	1	SA	
C4M01	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M02	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4M03	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M04	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M05	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4M06	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
C4M07	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M08	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4M09	2401-000909	C-AL;22uF,20%,16V,GP,TP,5x5,2.5	1	SA	
C4M10	2401-001249	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	1	SA	
C4M11	2401-001249	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	1	SA	
C4M12	2401-000909	C-AL;22uF,20%,16V,GP,TP,5x5,2.5	1	SA	
C4M13	2401-001249	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	1	SA	
C4M14	2401-001249	C-AL;4.7uF,20%,35V,GP,TP,4x5,2.5	1	SA	
C4M15	2203-000531	C-CER,CHIP;2.7nF,10%,50V,X7R,TP,1608,-	1	SA	
C4M16	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M16A	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	1	SA	
C4M17	2401-002112	C-AL;10uF,20%,16V,GP,TP,4x7,2.5	1	SA	
C4M17A	2203-000323	C-CER,CHIP;12nF,10%,50V,X7R,TP,2012,-	1	SA	
C4M18A	2203-000357	C-CER,CHIP;0.15NF,5%,50V,C0G,TP,1608	1	SA	
C4M19A	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	1	SA	
C4M20	2401-002569	C-AL;2.2uF,20%,50V,GP,TP,4x5,2.5	1	SA	
C4M21	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4M22	2401-002569	C-AL;2.2uF,20%,50V,GP,TP,4x5,2.5	1	SA	
C4M23	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C4M24	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
C4M31	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
C4M32	2202-000797	C-CERAMIC,MLC-AXIAL;10NF,30%,16V,Y5S,TP,	1	SA	
C603	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	SA	
C616	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C617	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	1	SA	
C618	2203-000552	C-CER,CHIP;0.02NF,5%,50V,C0G,TP,1608	1	SA	
C619	2203-000552	C-CER,CHIP;0.02NF,5%,50V,C0G,TP,1608	1	SA	
C620	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	1	SA	
C621	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	1	SA	
C622	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	1	SA	
C623	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
C624	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
C625	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
C626	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
C627	2203-001697	C-CER,CHIP;0.082nF,5%,50V,NP0,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
C628	2401-001168	C-AL;33uF,20%,16V,GP,TP,6.3x5,2.5	1	SA	
C629	2203-005221	C-CER,CHIP;15nF,10%,50V,X7R,TP,1608,-	1	SA	
C630	2401-002144	C-AL;47uF,20%,16V,GP,TP,5x11,5	1	SA	
C631	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
C635	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
C647	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	1	SA	
C651	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	1	SA	
C652	2203-000681	C-CER,CHIP;0.027nF,5%,50V,C0G,1608	1	SA	
C658	2202-000295	C-CERAMIC,MLC-AXIAL;68pF,5%,50V,SL,TP,3.	1	SA	
CD01	0402-001494	DIODE-RECTIFIER;SF24G,200V,2A,DO-15,TP	1	SA	
CE76	2401-000118	C-AL;1000uF,20%,10V,GP,TP,10x12.5,5	1	SA	
CN20	3708-001802	CONNECTOR-FPC/FFC/PIC;10P,1.25MM,STRAIGH	1	SA	
CN7	3722-002118	JACK-IEEE1394;4P,NI,BLK,ANGLE,IEEE1394	1	SA	
D5	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
E201	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
E202	2401-000588	C-AL;1uF,20%,50V,GP,TP,3x5,2.5	1	SA	
E205	2401-000598	C-AL;1uF,20%,50V,GP,TP,4x7,5	1	SA	
E212	2401-001492	C-AL;47uF,20%,16V,GP,-,5x7mm,2.5	1	SA	
E300	2401-001492	C-AL;47uF,20%,16V,GP,-,5x7mm,2.5	1	SA	
ESD01	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD02	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD03	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD04	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD05	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD06	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD07	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
ESD08	0403-000718	DIODE-ZENER;MTZJ6.8B,6.52-6.79V,500MW,DO	1	SA	
FC10	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
FC12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
FC6	2401-000240	C-AL;100uF,20%,10V,GP,TP,5x11,5	1	SA	
FD2	0407-000114	DIODE-ARRAY;DAN202K,80V,100mA,CA2-3,SOT-	1	SA	
FD3	0402-000165	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	1	SA	
FD4	0401-000101	DIODE-SWITCHING;1N4148,75V,150mA,DO-35,T	1	SA	
FD6	0402-000165	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	1	SA	
FD7	0402-000165	DIODE-RECTIFIER;1N5819,40V,1A,DO-41,TP	1	SA	
FE4	2401-003936	C-AL;100uF,20%,10V,GP,TP,6.3x5mm,2.	1	SA	
FE5	2401-000199	C-AL;1000uF,20%,6.3V,GP,TP,10x12.5,	1	SA	
FIC5	AC14-12006C	IC;KA7533,DIP,-	1	SA	
FL1	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	SA	
FL4	2701-000114	INDUCTOR-AXIAL;10UH,10%,2534	1	SA	
FR24	2007-000100	R-CHIP;68Kohm,5%,1/10W,TP,1608	1	SA	
FR25	2007-000503	R-CHIP;2.2ohm,5%,1/10W,TP,1608	1	SA	
GC1	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC2	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
GC4	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC5	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GC6	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
GE1	2401-000408	C-AL;10uF,20%,16V,GP,TP,3.5x5,2.5	1	SA	
GL1	3301-000314	BEAD-SMD;120ohm,1.6x0.8x0.8mm,150mA,,,,	1	SA	
GQ1	0501-000465	TR-SMALL SIGNAL;MMBT3904,NPN,350mW,SOT-2	1	SA	
GQ2	0501-000590	TR-SMALL SIGNAL;KST3906,PNP,225mW,SOT-23	1	SA	
GR1	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
GR2	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
GR3	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
GR4	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
GR5	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
GR6	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
GR7	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
GR8	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
IC201	0801-001270	IC-CMOS LOGIC;4052,MUX/DEMUX,SOP,16,150M	1	SA	
IC203	0801-001270	IC-CMOS LOGIC;4052,MUX/DEMUX,SOP,16,150M	1	SA	
IC4M01	1204-002337	IC-DECODER;LA72700V,SSOP,36P,275MIL,PLAS	1	SA	
IC601	AC09-00475A	IC MICOM;MN101DF10G,-,100PIN,5V,14.313M	1	SA	
IC603	1103-001330	IC-EEPROM;S524A40X41,512x8Bit,DIP,8P,9.2	1	SA	
L1	2701-000002	INDUCTOR-AXIAL;100UH,10%,4298	1	SA	
L331	2701-000114	INDUCTOR-AXIAL;10UH,10%,2534	1	SA	
P022	3711-005612	CONNECTOR-HEADER;BOX,30P,2R,2mm,STRAIGHT	1	SA	
P022	3711-005612	CONNECTOR-HEADER;BOX,30P,2R,2mm,STRAIGHT	1	SA	
P022	AC37-00027A	CONNECTOR-HEADER;20045WS,X-11,T8.5,W17.4	1	SA	
P77C3	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
P77C4	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
P77C5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
P77C6	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
P77C7	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
PE4	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
POR01	2007-000080	R-CHIP;2Kohm,5%,1/10W,TP,1608	1	SA	
POR02	2001-000591	R-CARBON;3.3KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
Q1	0501-000362	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1000mW,TO	1	SA	
Q2	0501-000362	TR-SMALL SIGNAL;KSC2328A-Y,NPN,1000mW,TO	1	SA	
Q4M01	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	1	SA	
Q4M02	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	1	SA	
Q4M03	0501-000398	TR-SMALL SIGNAL;KSC945,NPN,250mW,TO-92,T	1	SA	
R1	2001-000405	R-CARBON;180OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R1000	0402-000127	DIODE-RECTIFIER;1N4002,100V,1A,DO-41,TP	1	SA	
R4M02	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
R4M04	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R4M05	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R4M06	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R4M07	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
R4M08	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	SA	
R4M09	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
R4M10	2007-000965	R-CHIP;5.1Kohm,5%,1/10W,TP,1608	1	SA	
R4M11	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	1	SA	
R4M12	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	SA	
R4M13	2007-000123	R-CHIP;1.5Kohm,5%,1/10W,TP,1608	1	SA	
R611	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R621	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R622	2001-000780	R-CARBON;470OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R623	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
R624	2001-000734	R-CARBON;4.7KOHM,5%,1/8W,AA,TP,1.8X3.2M	1	SA	
R633	2007-000106	R-CHIP;220Kohm,5%,1/10W,TP,1608	1	SA	
R638	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	SA	
R639	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	1	SA	
R652	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R653	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
R654	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
R656	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R666	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
R667	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
R668	2701-000117	INDUCTOR-AXIAL;10uH,5%,2434	1	SA	
R670	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R671	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R672	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
R673	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
R674	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
R676	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
R677	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R678	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R680	2007-000081	R-CHIP;2.7Kohm,5%,1/10W,TP,1608	1	SA	
R6A01	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R6A03	2001-000281	R-CARBON;100OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R6A04	2001-000429	R-CARBON;1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
R6A10	2001-000290	R-CARBON;10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	SA	
TC11	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TC74	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
TE31	2401-000909	C-AL;22uF,20%,16V,GP,TP,5x5,2.5	1	SA	
TE32A	2404-001272	C-TA,CHIP;100uF,20%,16V,-,TP,7343	1	SA	
TE33	2401-001492	C-AL;47uF,20%,16V,GP,-,5x7mm,2.5	1	SA	
TE8	2401-001840	C-AL;100uF,20%,16V,GP,TP,6.3x11,5	1	SA	
TIC2	1201-001063	IC-OP AMP;2267,SOP,8P,300MIL,DUAL,6.7dB,	1	SA	
TM1	AK40-00020A	TM BLOCK;TCSN9082PA26A,NTSC,181CH,-,25d	1	SA	
TR23	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
TR4	2007-000121	R-CHIP;820ohm,5%,1/10W,TP,1608	1	SA	
TR5	2007-000121	R-CHIP;820ohm,5%,1/10W,TP,1608	1	SA	
VC1	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC14	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC15	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC15A	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC16	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC17	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC18	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC19	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC20	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC21	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC22	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC23	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC24	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC25	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC26	2203-000332	C-CER,CHIP;0.012NF,5%,50V,C0G,TP,1608	1	SA	
VC5	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC6	2202-002037	C-CERAMIC,MLC-AXIAL;100nF,80-20%,50V,Y5V	1	SA	
VC7	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VDR1	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VDR2	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VDR3	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VDR4	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VDR5	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VDR6	2007-000040	R-CHIP;150ohm,1%,1/10W,TP,1608	1	SA	
VE1	2401-002165	C-AL;100uF,20%,16V,GP,TP,6.3x7,5	1	SA	
VE10	2401-001479	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	1	SA	
VE11	2401-001492	C-AL;47uF,20%,16V,GP,-,5x7mm,2.5	1	SA	
VE4	2401-001479	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	1	SA	
VE5	2401-001479	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
VE6	2401-001479	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	1	SA	
VE7	2401-001479	C-AL;470uF,20%,10V,GP,TP,6.3*11mm,5	1	SA	
VIC1	1201-002085	IC-VIDEO AMP;MM1623XFBE,SOP-28D,28P,17.7	1	SA	
VL6	2703-000398	INDUCTOR-SMD;10uH,10%,3225	1	SA	
VR30	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR31	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR32	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR33	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR34	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR35	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR36	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR40	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VR51	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
VR60	2007-001167	R-CHIP;75ohm,5%,1/10W,TP,1608	1	SA	
VZ1	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ10	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ11	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ12	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ2	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ3	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ4	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ5	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ6	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ7	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ8	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
VZ9	0403-001083	DIODE-ZENER;UDZ9.1B,8.85-9.23V,200MW,UMD	1	SA	
XT4M01	2801-003399	CRYSTAL-UNIT;3.579545MHz,15ppm,28-AAA,S,	1	SA	
XT601	2801-001384	CRYSTAL-UNIT;14.31818MHz,30ppm,28-AAA,16	1	SC	
XT602	2801-003318	CRYSTAL-UNIT;32.768KHz,20ppm,28-AAP,12.5	1	SA	
ZD1	0403-000720	DIODE-ZENER;MTZJ9.1B,8.57-9.01V,500MW,DO	1	SC	
	AH65-00001A	CLAMPER CORE;DVD-909,DALA-2,-,-,BLK,XAA	1	SA	
H001	**AK97-01211A**	**ASSY-ASSY LOADER DRIVE;-,SV-R250,ASSY LO**	**1**	**SA**	
W019	6003-001478	SCREW-TAPTITE;PH,+,B,M2.6,L8,ZPC(YEL)	2	SA	
	AK92-00595A	ASSY PCB-FRONT END;SV-R250,FRONT-END PCB	1	SA	
	AC99-40098E	ASSY PCB-FRONT END,c;SV-R250,FRONT-END P	1	SNA	
	0202-001221	SOLDER-CREAM;PF305-116HO(A),-,25~45 ß≠,9	4.04	SNA	
	AK41-00352A	**PCB MAIN-F/END;SV-R2500,EPOXY,4,-,T1.2,1**	**0.5**	**SNA**	
AR1	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR2	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
AR3	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
CC2	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
CC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
CIC1	1203-003177	IC-VOL. DETECTOR;BD5326G,SSOP,5P,2.9x1.6	1	SA	
CON1	3708-002092	CONNECTOR-FPC/FFC/PIC;54P,0.5mm,SMD-A,SN	1	SA	
CON2	3708-002018	CONNECTOR-FPC/FFC/PIC;4P,1MM,SMD-A,SN,N,	1	SA	
CON3	3708-001878	CONNECTOR-FPC/FFC/PIC;6P,1MM,SMD-A,SNPB,	1	SA	
CON4	3708-002067	CONNECTOR-FPC/FFC/PIC;12P,1mm,SMD-A,SN,N	1	SA	
CR1	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CR13	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
CR2	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CR3	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CR4	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	

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CR5	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CR6	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
CR7	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
JP9	3708-001331	CONNECTOR-FPC/FFC/PIC;40P,0.5mm,SMD-A,AU	1	SA	
PC12	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC14	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC17	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC18	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC19	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC21	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC22	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PC8	2402-001042	C-AL,SMD;100uF,20%,16V,GP,TP,6.6x6.6x5.	1	SA	
PC9	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
PCN	3711-005477	HEADER-BOARD TO CABLE;BOX,4P,1R,2mm,SMD-	1	SA	
PIC2	1203-003176	IC-MULTI REG.;BA33C18HFP,HRP,5P,9.39X8MM	1	SA	
PL1	2901-001281	FILTER-EMI SMD;16V,2A,-,220000pF,2.00x1.	1	SA	
PL2	2901-001281	FILTER-EMI SMD;16V,2A,-,220000pF,2.00x1.	1	SA	
PL4	2901-001281	FILTER-EMI SMD;16V,2A,-,220000pF,2.00x1.	1	SA	
PL5	2901-001281	FILTER-EMI SMD;16V,2A,-,220000pF,2.00x1.	1	SA	
PL6	2901-001281	FILTER-EMI SMD;16V,2A,-,220000pF,2.00x1.	1	SA	
R118	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
R119	2007-000113	R-CHIP;33ohm,5%,1/10W,TP,1608	1	SA	
R51	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RC1	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC10	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC11	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC12	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC14	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC16	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC17	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC18	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC19	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC2	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC20	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC21	2203-001697	C-CER,CHIP;0.082nF,5%,50V,NP0,1608	1	SA	
RC22	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC23	2203-001697	C-CER,CHIP;0.082nF,5%,50V,NP0,1608	1	SA	
RC24	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC25	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC26	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC27	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC28	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC29	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC30	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC31	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC32	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC33	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC34	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC35	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC36	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
RC37	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC38	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC39	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC4	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC40	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC41	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC42	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC43	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC44	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC45	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC46	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
RC47	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC48	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC5	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC50	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC51	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC52	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC53	2203-000560	C-CER,CHIP;220nF,+80-20%,25V,Y5V,TP,1608	1	SA	
RC54	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC55	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC56	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC57	2203-000560	C-CER,CHIP;220nF,+80-20%,25V,Y5V,TP,1608	1	SA	
RC58	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC59	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC6	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
RC60	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RC61	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RC62	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC63	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC64	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC65	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC67	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
RC7	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
RC74	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	1	SA	
RC75	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
RC76	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
RC77	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
RC8	2203-000626	C-CER,CHIP;0.022nF,5%,50V,C0G,TP,1608	1	SA	
RC9	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
RD32	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
RIC1	1001-001183	IC-ANALOG SWITCH;MAX4684EUB,-,TSSOP,10P,	1	SA	
RIC2	AK13-00018A	IC ASIC;S1L1491X,-,128 PIN,7V,-0 ~ +70	1	SNA	
RR1	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR10	2007-001161	R-CHIP;75Kohm,5%,1/10W,TP,1608	1	SA	
RR11	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR12	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR13	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR14	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR15	2007-000591	R-CHIP;22ohm,1%,1/10W,TP,1608	1	SA	
RR16	2007-000591	R-CHIP;22ohm,1%,1/10W,TP,1608	1	SA	
RR17	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR18	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR19	2007-000106	R-CHIP;220Kohm,5%,1/10W,TP,1608	1	SA	
RR2	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
RR20	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
RR21	2007-000431	R-CHIP;16Kohm,5%,1/10W,TP,1608	1	SA	
RR22	2007-000109	R-CHIP;1Mohm,5%,1/10W,TP,1608	1	SA	
RR23	2007-000106	R-CHIP;220Kohm,5%,1/10W,TP,1608	1	SA	
RR24	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
RR25	2007-000092	R-CHIP;15Kohm,5%,1/10W,TP,1608	1	SA	
RR26	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR27	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR28	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR29	2007-001056	R-CHIP;6.2Kohm,5%,1/10W,TP,1608	1	SA	
RR3	2007-000591	R-CHIP;22ohm,1%,1/10W,TP,1608	1	SA	
RR30	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
RR31	2007-000616	R-CHIP;24Kohm,5%,1/10W,TP,1608	1	SA	
RR32	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR33	2007-000098	R-CHIP;56Kohm,5%,1/10W,TP,1608	1	SA	
RR34	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
RR35	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR36	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
RR37	2007-000097	R-CHIP;47Kohm,5%,1/10W,TP,1608	1	SA	
RR38	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR39	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR4	2007-000591	R-CHIP;22ohm,1%,1/10W,TP,1608	1	SA	
RR40	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR400	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
RR41	2007-000309	R-CHIP;10ohm,5%,1/10W,TP,1608	1	SA	
RR42	2007-000309	R-CHIP;10ohm,5%,1/10W,TP,1608	1	SA	
RR5	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	SA	
RR6	2007-000102	R-CHIP;100Kohm,5%,1/10W,TP,1608	1	SA	
RR7	2007-000616	R-CHIP;24Kohm,5%,1/10W,TP,1608	1	SA	
RR8	2007-000079	R-CHIP;1.8Kohm,5%,1/10W,TP,1608	1	SA	
RR9	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
U1	1107-001546	IC-FLASH MEMORY;29LV400B,512Kx8/256Kx16B	1	SNA	
U8	AK13-00017A	IC ASIC;S5L1482A01,BD-R1000,256,3.3V,0	1	SNA	
U9	1107-001369	IC-FLASH MEMORY;29LV800,8Mbit,1Mx8/512Kx	1	SNA	
UB1	1105-001305	IC-DRAM;4S641632,-,64MBIT,1MX16X4BIT,T	1	SA	
UC1	2203-000998	C-CER,CHIP;0.047NF,5%,50V,C0G,TP,1608	1	SA	
UC10	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC11	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC12	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC14	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC16	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC17	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC18	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC19	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC2	2203-000998	C-CER,CHIP;0.047NF,5%,50V,C0G,TP,1608	1	SA	
UC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC21	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC22	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC23	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC24	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC25	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC26	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC27	2203-000440	C-CER,CHIP;1nF,10%,50V,X7R,TP,1608,-	1	SA	
UC28	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
UC29	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC3	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC30	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC31	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC32	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC33	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC34	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC35	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC36	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC37	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC38	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC39	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC4	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC40	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC41	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC42	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC43	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC44	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC45	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC46	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC48	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC49	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC5	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC50	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC51	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC52	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC53	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC54	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC55	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC56	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC57	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC58	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC59	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
UC6	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC60	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC61	2203-000357	C-CER,CHIP;0.15NF,5%,50V,C0G,TP,1608	1	SA	
UC62	2203-001071	C-CER,CHIP;0.056nF,5%,50V,C0G,1608	1	SA	
UC63	2203-000384	C-CER,CHIP;0.015NF,5%,50V,C0G,TP,1608	1	SA	
UC64	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC65	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC66	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC67	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC68	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC69	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC7	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC70	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC71	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC72	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC73	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC74	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC75	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC76	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC77	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC78	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	
UC79	2203-000236	C-CER,CHIP;0.1NF,5%,50V,C0G,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
UC8	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UC9	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
UR1	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
UR10	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
UR11	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
UR12	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
UR13	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
UR14	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
UR15	2007-000072	R-CHIP;47ohm,5%,1/10W,TP,1608	1	SA	
UR16	2007-000109	R-CHIP;1Mohm,5%,1/10W,TP,1608	1	SA	
UR18	2007-000704	R-CHIP;3.6Kohm,5%,1/10W,TP,1608	1	SA	
UR2	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
UR20	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR21	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR22	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR23	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR24	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR25	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR26	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR27	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR28	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR29	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR3	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
UR30	2007-000082	R-CHIP;3.3Kohm,5%,1/10W,TP,1608	1	SA	
UR31	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR32	2007-000134	R-CHIP;33Kohm,5%,1/10W,TP,1608	1	SA	
UR36	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
UR37	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR38	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR39	2007-000125	R-CHIP;3.9Kohm,5%,1/10W,TP,1608	1	SA	
UR4	2011-000475	R-NET;33OHM,5%,1/16W,L,CHIP,8P,TP,32	1	SA	
UR40	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR42	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR44	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR45	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR48	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR49	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR5	2011-001085	R-NET;82OHM,5%,1/16W,L,CHIP,8P,TP	1	SA	
UR50	2007-000119	R-CHIP;560ohm,5%,1/10W,TP,1608	1	SA	
UR51	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	SA	
UR52	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR54	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR55	2007-000084	R-CHIP;4.7Kohm,5%,1/10W,TP,1608	1	SA	
UR58	2007-000124	R-CHIP;2.2Kohm,5%,1/10W,TP,1608	1	SA	
UR59	2007-000121	R-CHIP;820ohm,5%,1/10W,TP,1608	1	SA	
UR6	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
UR60	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR61	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR62	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR63	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR65	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR66	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR68	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR69	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
UR7	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
UR71	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR72	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR73	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
UR74	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR75	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
UR76	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
UR77	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	1	SA	
UR78	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
UR8	2007-000115	R-CHIP;82ohm,5%,1/10W,TP,1608	1	SA	
UR9	2007-000071	R-CHIP;22ohm,5%,1/10W,TP,1608	1	SA	
VC1	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC10	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC11	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC12	2404-000284	C-TA,CHIP;10uF,20%,16V,-,TP,3528	1	SA	
VC13	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC14	2203-000257	C-CER,CHIP;10nF,10%,50V,X7R,TP,1608	1	SA	
VC15	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC16	2404-000212	C-TA,CHIP;3.3uF,20%,25V,-,TP,3528	1	SA	
VC19	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC2	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC20	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC21	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC23	2203-005148	C-CER,CHIP;100nF,10%,16V,X7R,TP,1608	1	SA	
VC3	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC4	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC5	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC6	2203-000843	C-CER,CHIP;39nF,10%,25V,X7R,TP,1608,-	1	SA	
VC7	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
VC8	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
VC9	2203-000491	C-CER,CHIP;2.2nF,10%,50V,X7R,TP,1608,-	1	SA	
VIC1	1003-001780	IC-MOTOR DRIVER;BD7954FS,SSOP,54P,22x11.	1	SA	
VR1	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
VR10	2007-000034	R-CHIP;1OHM,5%,1/4W,TP,3216	1	SA	
VR11	2007-000034	R-CHIP;1OHM,5%,1/4W,TP,3216	1	SA	
VR12	2007-000034	R-CHIP;1OHM,5%,1/4W,TP,3216	1	SA	
VR13	2007-000502	R-CHIP;2.2ohm,5%,1/8W,TP,2012	1	SA	
VR14	2007-000502	R-CHIP;2.2ohm,5%,1/8W,TP,2012	1	SA	
VR15	2007-000502	R-CHIP;2.2ohm,5%,1/8W,TP,2012	1	SA	
VR16	2007-000502	R-CHIP;2.2ohm,5%,1/8W,TP,2012	1	SA	
VR17	2007-000965	R-CHIP;5.1Kohm,5%,1/10W,TP,1608	1	SA	
VR18	2007-000074	R-CHIP;100ohm,5%,1/10W,TP,1608	1	SA	
VR19	2007-000093	R-CHIP;20Kohm,5%,1/10W,TP,1608	1	SA	
VR2	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
VR20	2007-000093	R-CHIP;20Kohm,5%,1/10W,TP,1608	1	SA	
VR21	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	1	SA	
VR22	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR23	2007-000029	R-CHIP;0ohm,5%,1/8W,TP,2012	1	SA	
VR24	2007-000029	R-CHIP;0ohm,5%,1/8W,TP,2012	1	SA	
VR27	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR28	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR3	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR4	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR5	2007-000090	R-CHIP;10Kohm,5%,1/10W,TP,1608	1	SA	
VR6	2007-000029	R-CHIP;0ohm,5%,1/8W,TP,2012	1	SA	
VR7	2007-001179	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark
VR8	2007-001179	R-CHIP;8.2Kohm,5%,1/10W,TP,1608	1	SA	
VR9	2007-000034	R-CHIP;1OHM,5%,1/4W,TP,3216	1	SA	
Y1	2801-004180	CRYSTAL-SMD;33.8688MHZ,50PPM,28-AAN,12PF	1	SA	
	AC99-90119M	ASSY PCB-FRONT END,m;SV-R250,FRONT-END P	1	SNA	
	0202-001214	SOLDER-WIRE FLUX;HI-ALMIT HR19M LFM2,-,D	0.167	SNA	
H001	AK97-01202A	ASSY-RECORDER DECK;ASSY,DP-R2,DP-R2	1	SNA	
W019	6003-001449	SCREW-TAPTITE;BH,+,B,M2.6,L6,NI PLT	5	SA	
W019	6003-001199	SCREW-TAPTITE;PWH,+,B,M2,L7,ZPC(YEL),SWR	4	SA	
W019	6003-001449	SCREW-TAPTITE;BH,+,B,M2.6,L6,NI PLT	2	SA	
H105	6602-001076	BELT-RECTANGULAR;CR,T1.2,4.3%,1.2X25.1,B	1	SA	
S.N.A.	3409-001138	SWITCH-DETECTOR;5V DC,1A,DPST,30GF,-	1	SA	
S.N.A.	AK31-00001A	MOTOR-LOADING;RF-300EH-1D390,DP-9,160MA,	1	SA	
W291	6001-001291	SCREW-MACHINE;CH(0.5),*,-,M1.7,L4,ZPC(BL	3	SA	
W019	6003-001148	SCREW-TAPTITE;PH,+,B,M1.7,L6,ZPC(BLK),SW	1	SA	
W018	6003-001450	SCREW-TAPTITE;PH,+,S,M2.6,L5,ZPC(YEL)	2	SA	
W212	6003-001251	SCREW-TAPTITE;CH,+,B,M1.7,L3,ZPC(YEL),SW	1	SA	
W212	6003-001251	SCREW-TAPTITE;CH,+,B,M1.7,L3,ZPC(YEL),SW	2	SA	
W291	6001-001719	SCREW-MACHINE;CH,+,M1.7,L4,NI PLT	1	SA	
S.N.A	2007-000070	R-CHIP;0ohm,5%,1/10W,TP,1608	2	SA	
S.N.A	2007-000075	R-CHIP;220ohm,5%,1/10W,TP,1608	1	SA	
S.N.A	2007-000078	R-CHIP;1Kohm,5%,1/10W,TP,1608	1	SA	
S.N.A	2007-000869	R-CHIP;4.7Kohm,1%,1/10W,TP,1608	2	SA	
S.N.A	2007-000929	R-CHIP;470ohm,1%,1/10W,TP,1608	1	SA	
S.N.A	2104-001087	VR-SMD;2.2Kohm,25%,0.15W,TOP	1	SA	
S.N.A	2104-001122	VR-SMD;470OHM,25%,1/10W,TOP	1	SA	
S.N.A	2203-000189	C-CER,CHIP;100nF,+80-20%,25V,Y5V,TP,1608	8	SA	
S.N.A	2203-005065	C-CER,CHIP;1000nF,+80-20%,10V,Y5V,1608	2	SA	
S.N.A	2203-005664	C-CER,CHIP;4700nF,10%,6.3V,X5R,2012	1	SA	
S.N.A	3301-001419	BEAD-SMD;220ohm,1608,500mA,TP,133ohm/70	2	SA	
S.N.A	3708-002092	CONNECTOR-FPC/FFC/PIC;54P,0.5mm,SMD-A,SN	1	SA	
I/B	AK68-00758B	MANUAL USERS;DVD-HR720,XAA,ENG,-,MOJO80,	1	SA	
S.N.A	AK69-00266J	PACKING CASE;DVD-HR720/XAA,SEA,SW-3,T5,W	1	SA	
VS062	3301-001623	CORE-FERRITE;AQ,68X2.5X13MM,-,-	1	SA	
W004	6003-000283	SCREW-TAPTITE;BH,+,B,M3,L8,ZPC(YEL),SWRC	3	SA	
W009	6003-000276	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(YEL),SWC	10	SA	
W009	6003-000276	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(YEL),SWC	3	SA	
W268	6003-000254	SCREW-TAPTITE;BH,+,S,M3,L6,ZPC(WHT),SM20	1	SA	
W270	6001-000742	SCREW-MACHINE;PH,+,UNC6-32,L4.2,ZPC(WHT)	4	SA	
W271	6009-001411	SCREW-SPECIAL;TH,+,-,M5,L14,NI PLT,SWRCH	2	SA	
W272	6003-001464	SCREW-TAPTITE;BH,+,B,M3,L10,ZPC(WHT)	5	SA	
W275	6003-001561	SCREW-TAPTITE;BH,+,-,B,M3,L6,ZPC(YEL),SW	14	SA	
W307	6001-001868	SCREW-MACHINE;PWH,+,-,M2.6,L4,ZPC(YEL),S	4	SA	
	AC39-00073A	CABLE-RCA;SJ01-08-099,1.2MT,3P,A/V,30A,5	1	SA	
	AC39-42001J	CABLE-RF ASSY;-,-,#1365,1200mm,3A,110V,C	1	SA	

Loc.No	Part No	Description ; Specification	Q'ty	S.N.A	Remark

8. Block Diagram

8-1 All Block Diagram - 8-2

8-2 DIC1 (DMN8602) Block Diagram - 8-3

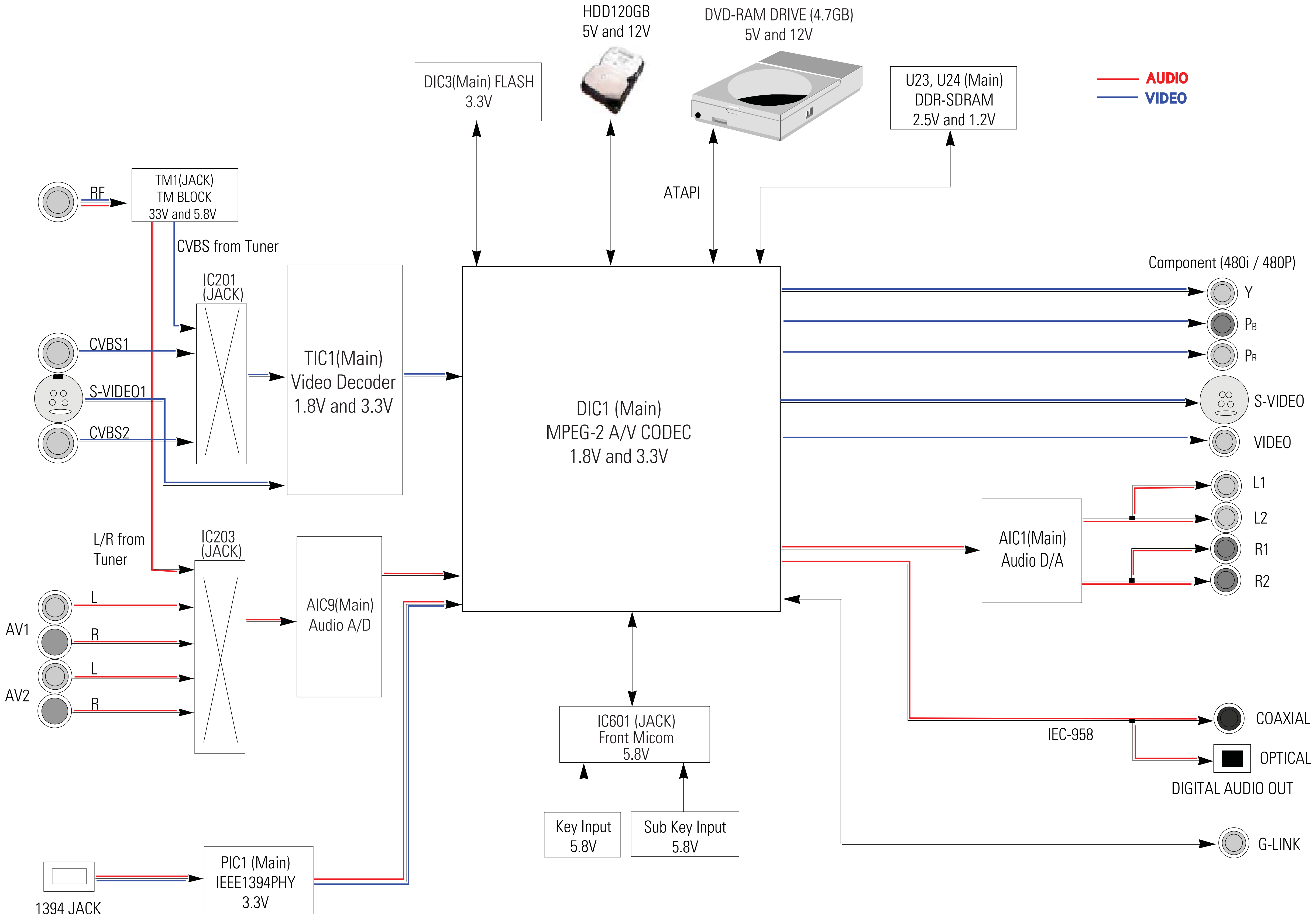
8-3 AIC1 (PCM1742) Block Diagram- 8-4

8-4 AIC9 (PCM1802) Block Diagram- 8-5

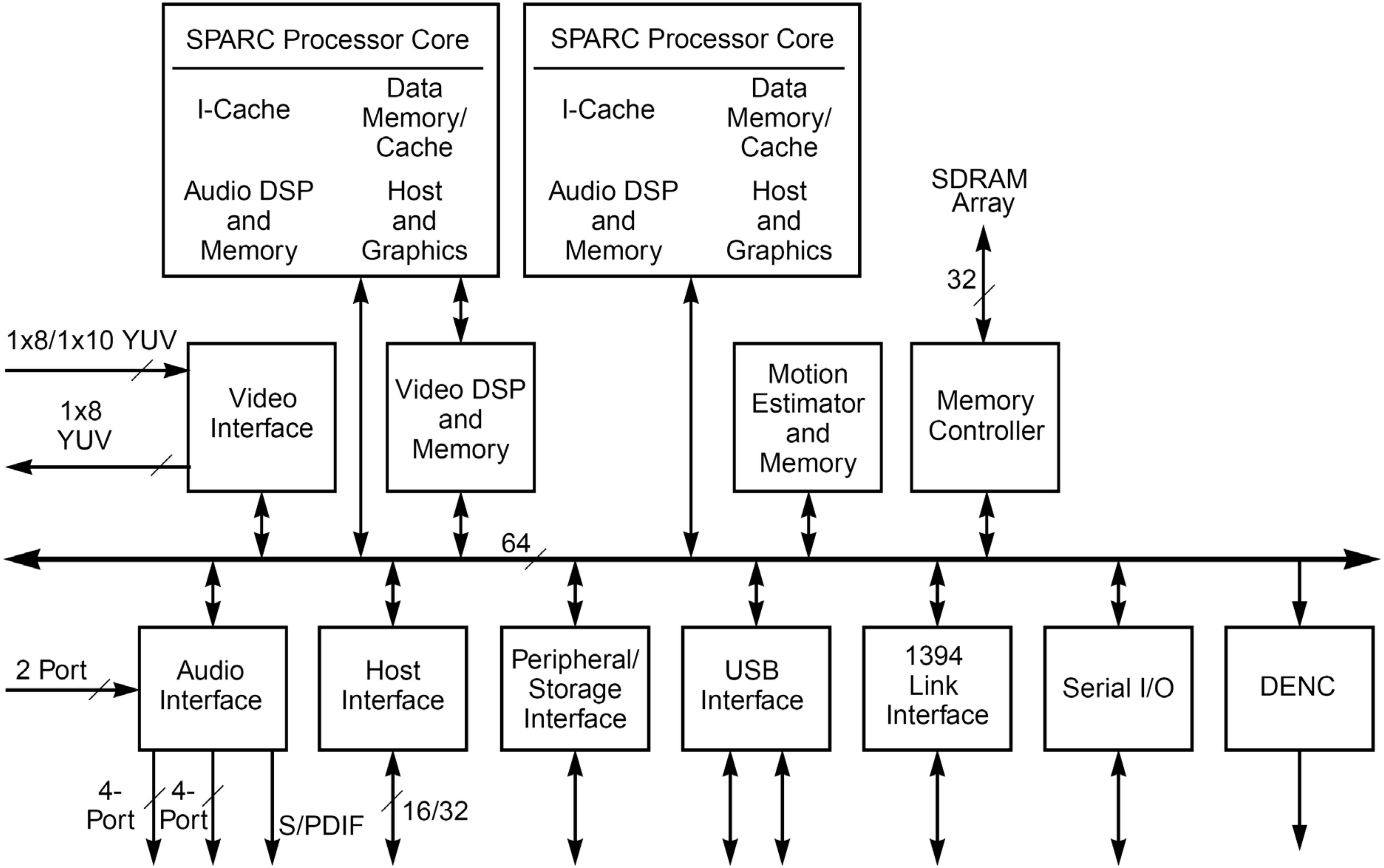
8-5 PIC1 (TSB4AB1) Block Diagram- 8-6

8-6 TIC1 (TVP5146) Block Diagram - 8-7

8-1 All Block Diagram


HDD120GB
5V and 12V
DVD-RAM DRIVE (4.7GB)
5V and 12V
DIC3(Main) FLASH
3.3V
U23, U24 (Main)
DDR-SDRAM
2.5V and 1.2V
AUDIO
VIDEO
ATAPI
RF
TM1(JACK)
TM BLOCK
33V and 5.8V
CVBS from Tuner
IC201
(JACK)
TIC1(Main)
Video Decoder
1.8V and 3.3V
CVBS1
S-VIDEO1
CVBS2
DIC1 (Main)
MPEG-2 A/V CODEC
1.8V and 3.3V
Component (480i / 480P)
Y
PB
PR
S-VIDEO
VIDEO
L1
L2
R1
R2
AIC1(Main)
Audio D/A
L/R from
Tuner
IC203
(JACK)
AIC9(Main)
Audio A/D
L
R
L
R
AV1
AV2
IC601 (JACK)
Front Micom
5.8V
Key Input
5.8V
Sub Key Input
5.8V
COAXIAL
IEC-958
OPTICAL
DIGITAL AUDIO OUT
G-LINK
PIC1 (Main)
IEEE1394PHY
3.3V
1394 JACK

8-2 DIC1 (DMN8602) Block Diagram


SPARC Processor Core
I-Cache
Data Memory/ Cache
Audio DSP and Memory
Host and Graphics
SPARC Processor Core
I-Cache
Data Memory/ Cache
Audio DSP and Memory
Host and Graphics
SDRAM Array
32
1x8/1x10 YUV
1x8 YUV
Video Interface
Video DSP and Memory
Motion Estimator and Memory
Memory Controller
64
2 Port
Audio Interface
Host Interface
Peripheral/ Storage Interface
USB Interface
1394 Link Interface
Serial I/O
DENC
4- Port
4- Port
S/PDIF
16/32

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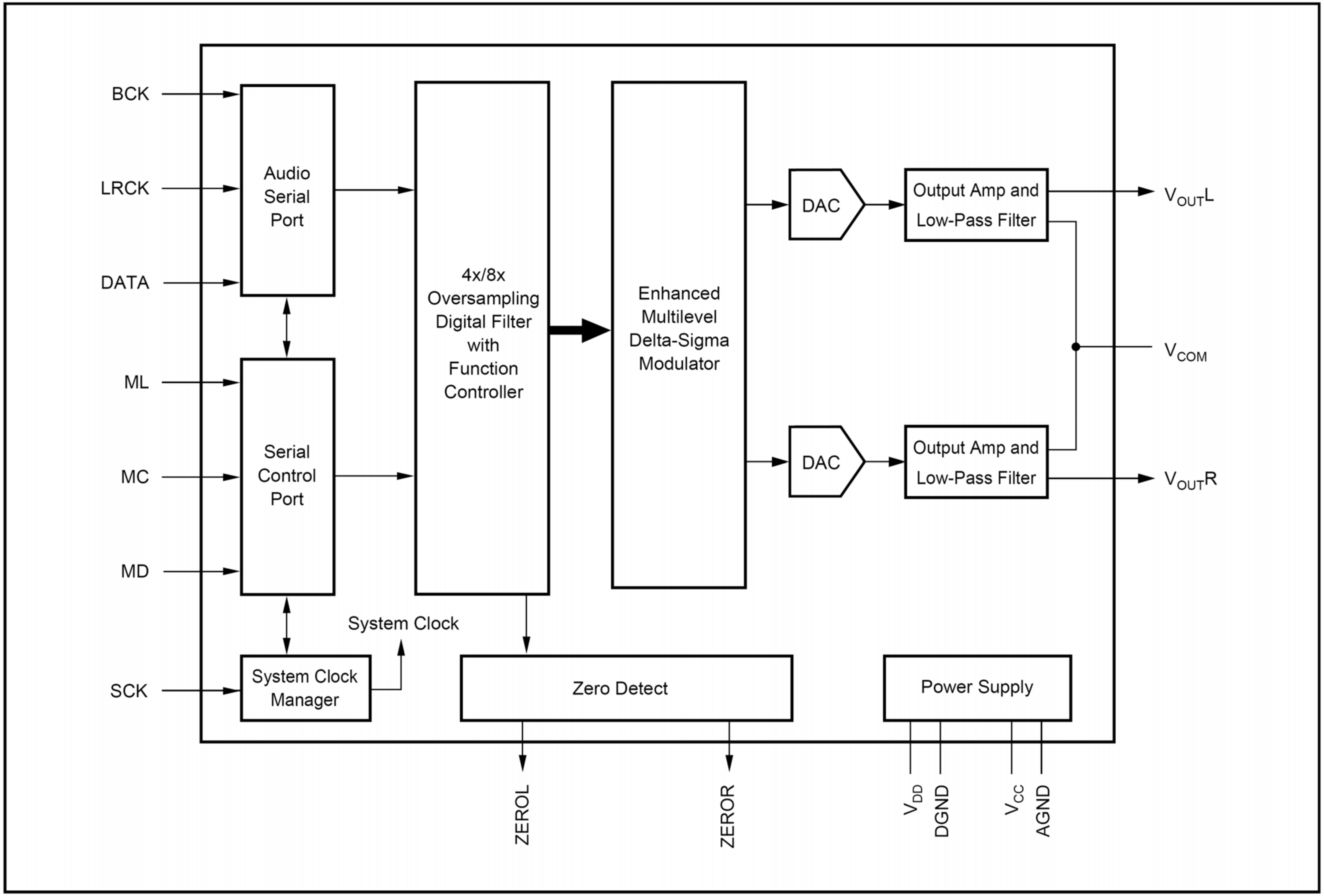
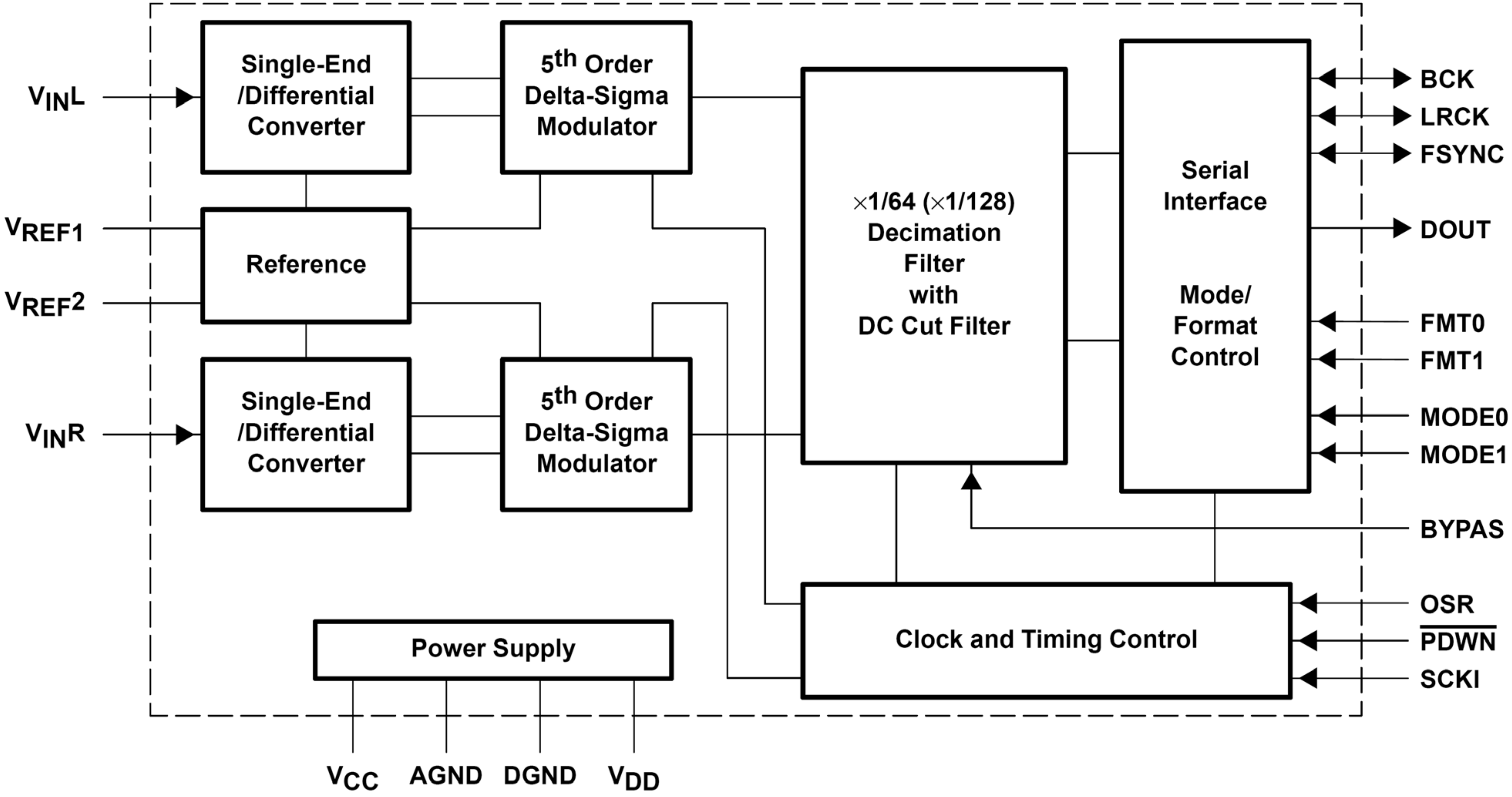
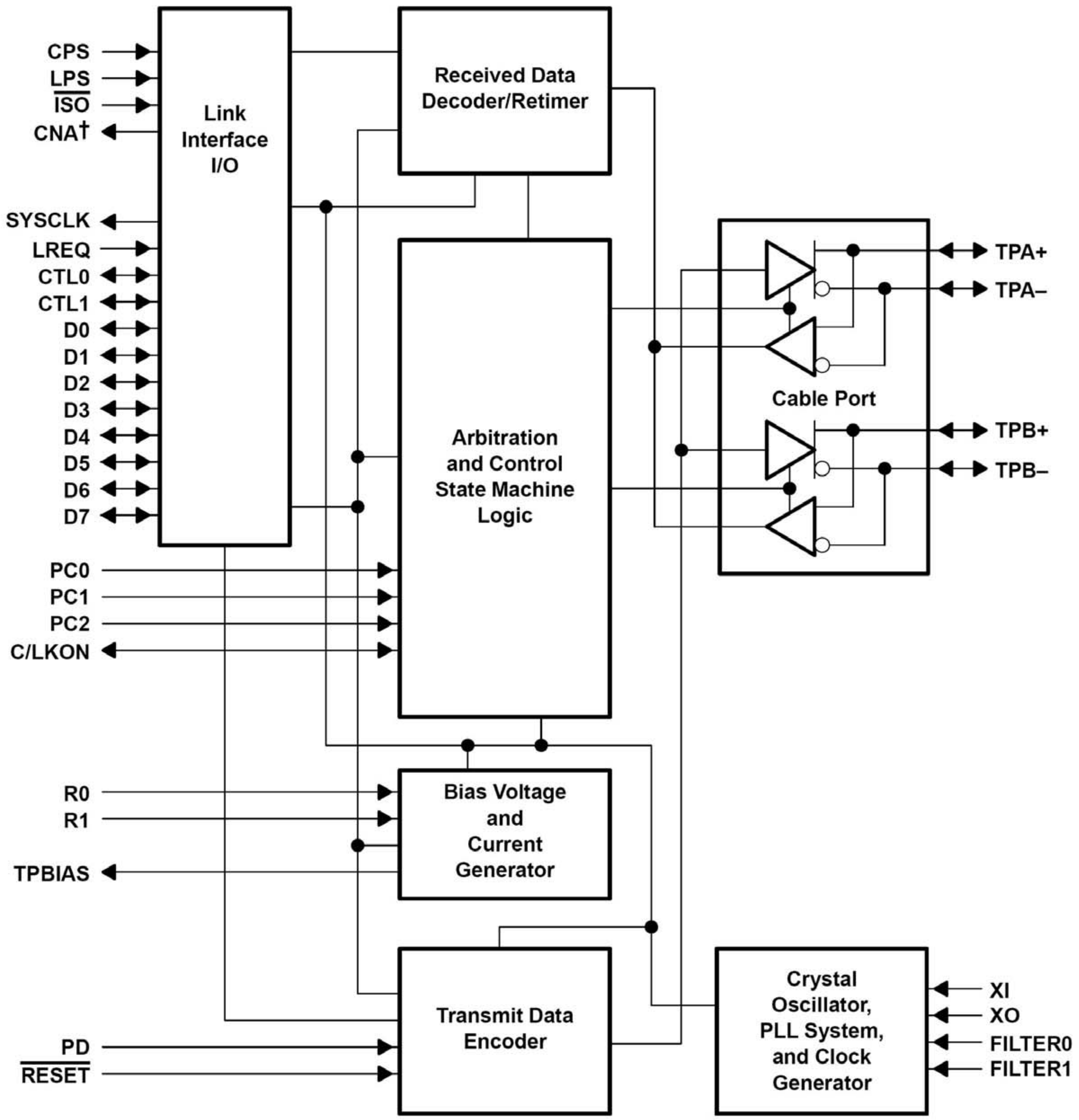
8-3 AIC1 (PCM1742) Block Diagram


BCK
LRCK
DATA
ML
MC
MD
SCK
Audio Serial Port
Serial Control Port
System Clock Manager
System Clock
4x/8x Oversampling Digital Filter with Function Controller
Enhanced Multilevel Delta-Sigma Modulator
DAC
DAC
Output Amp and Low-Pass Filter
Output Amp and Low-Pass Filter
$V_{OUT}L$
V_{COM}
$V_{OUT}R$
Zero Detect
Power Supply
ZEROL
ZEROR
V_{DD}
DGND
V_{CC}
AGND

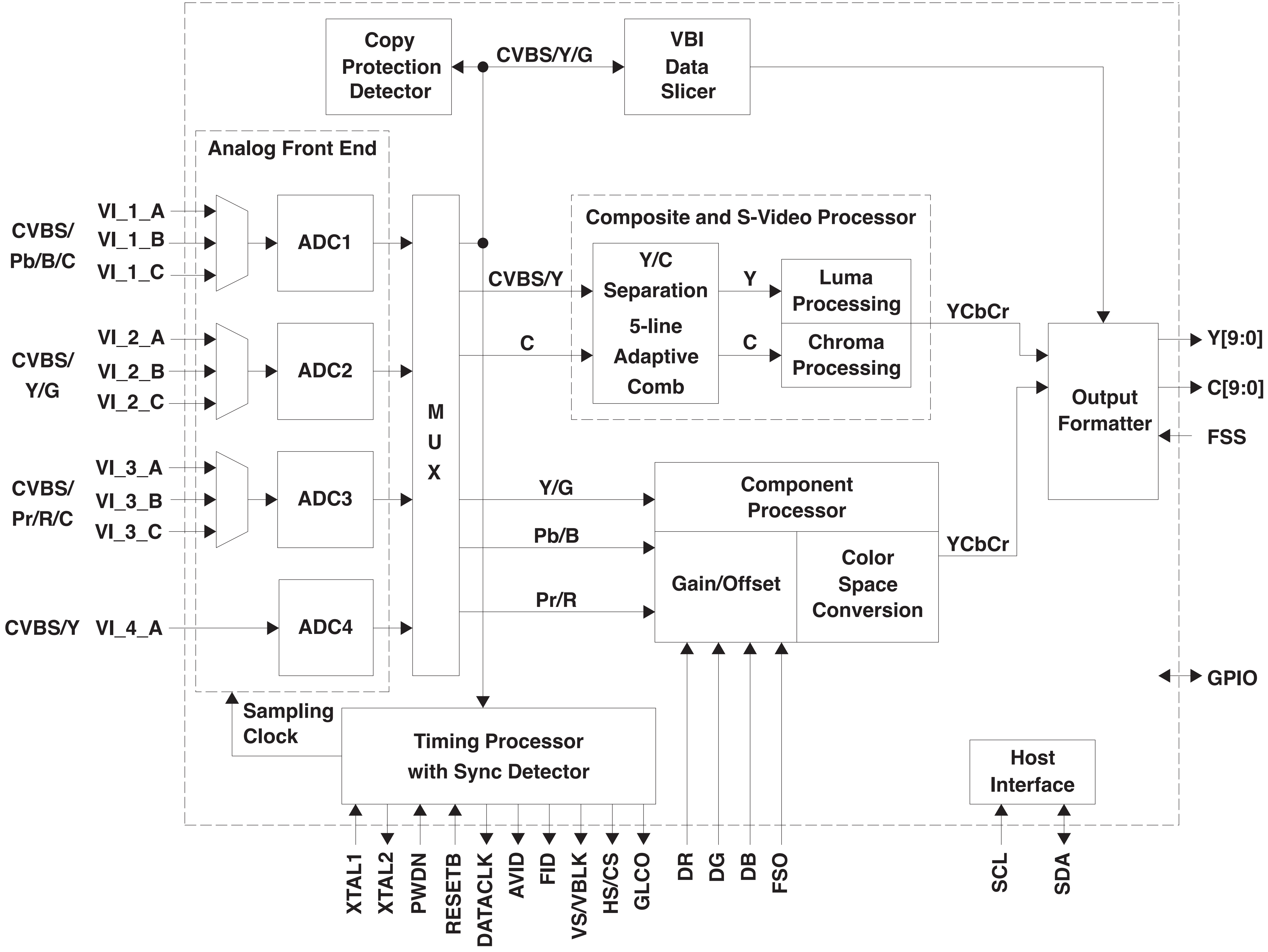
8-4 AIC9 (PCM1802) Block Diagram


$V_{IN}L$
$V_{REF}1$
$V_{REF}2$
$V_{IN}R$
Single-End /Differential Converter
Reference
Single-End /Differential Converter
5th Order Delta-Sigma Modulator
5th Order Delta-Sigma Modulator
×1/64 (×1/128) Decimation Filter with DC Cut Filter
Serial Interface
Mode/ Format Control
Clock and Timing Control
Power Supply
BCK
LRCK
FSYNC
DOUT
FMT0
FMT1
MODE0
MODE1
BYPAS
OSR
$\overline{PDWN}$
SCKI
V_{CC}
AGND
DGND
V_{DD}

8-5 PIC1 (TSB4AB1) Block Diagram

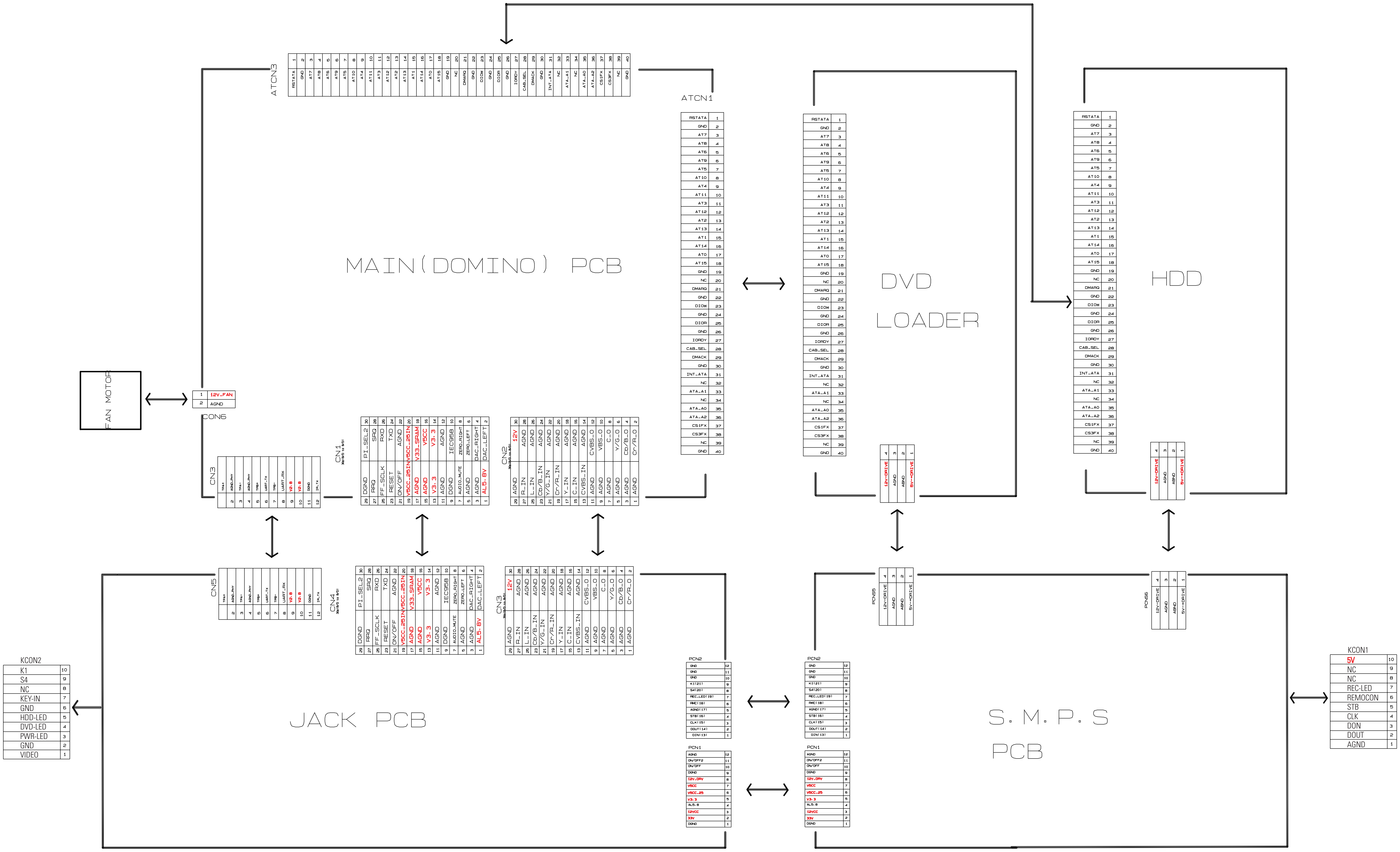

CPS
LPS
ISO
CNA†
SYSCLK
LREQ
CTL0
CTL1
D0
D1
D2
D3
D4
D5
D6
D7
PC0
PC1
PC2
C/LKON
R0
R1
TPBIAS
PD
RESET
Link Interface I/O
Received Data Decoder/Retimer
Arbitration and Control State Machine Logic
Bias Voltage and Current Generator
Transmit Data Encoder
Cable Port
TPA+
TPA–
TPB+
TPB–
Crystal Oscillator, PLL System, and Clock Generator
XI
XO
FILTER0
FILTER1

8-6 TIC1 (TVP5146) Block Diagram


Copy Protection Detector
CVBS/Y/G
VBI Data Slicer
Analog Front End
CVBS/ Pb/B/C
VI_1_A
VI_1_B
VI_1_C
ADC1
CVBS/ Y/G
VI_2_A
VI_2_B
VI_2_C
ADC2
CVBS/ Pr/R/C
VI_3_A
VI_3_B
VI_3_C
ADC3
CVBS/Y
VI_4_A
ADC4
MUX
Composite and S-Video Processor
CVBS/Y
C
Y/C Separation 5-line Adaptive Comb
Y
C
Luma Processing
Chroma Processing
YCbCr
Output Formatter
Y[9:0]
C[9:0]
FSS
Y/G
Pb/B
Pr/R
Component Processor
Gain/Offset
Color Space Conversion
YCbCr
GPIO
Sampling Clock
Timing Processor with Sync Detector
Host Interface
XTAL1
XTAL2
PWDN
RESETB
DATACLK
AVID
FID
VS/VBLK
HS/CS
GLCO
DR
DG
DB
FSO
SCL
SDA

MEMO

9. Wiring Diagram


MAIN(DOMINO) PCB
ATCN3
ATCN1
RSTATA 1
GND 2
AT7 3
AT8 4
AT6 5
AT9 6
AT5 7
AT10 8
AT4 9
AT11 10
AT3 11
AT12 12
AT2 13
AT13 14
AT1 15
AT14 16
AT0 17
AT15 18
GND 19
NC 20
DMARQ 21
GND 22
DIOW 23
GND 24
DIOR 25
GND 26
IORDY 27
CAB_SEL 28
DMACK 29
GND 30
INT_ATA 31
NC 32
ATA_A1 33
NC 34
ATA_A0 35
ATA_A2 36
CS1FX 37
CS3FX 38
NC 39
GND 40
DVD LOADER
HDD
12V-DRIVE 4
AGND 3
AGND 2
5V-DRIVE 1
PCN25
PCN56
FAN MOTOR
1 12V_FAN
2 AGND
CON6
CN3
CN5
TPA+
AGND_PHY 2
TPA- 3
AGND_PHY 4
TPB+ 5
UART_TX 6
TPB- 7
UART_RX 8
V2.8 9
V2.8 10
DGND 11
IR_TX 12
CN1
CN4
30p(B/D to B/D)
PI_SEL2 30
SRQ 28
RXD 26
TXD 24
AGND 22
V5CC_25IN 20
V33_SRAM 18
V5CC 16
V3.3 14
AGND 12
IEC958 10
ZERO_RIGHT 8
ZERO_LEFT 6
DAC_RIGHT 4
DAC_LEFT 2
DGND 29
RRQ 27
FF_SCLK 25
RESET 23
ON/OFF 21
V5CC_25IN 19
AGND 17
AGND 15
V3.3 13
AGND 11
DGND 9
AUDIO_MUTE 7
AGND 5
AGND 3
AL5.8V 1
CN2
CN3
12V 30
AGND 28
AGND 26
AGND 24
AGND 22
AGND 20
AGND 18
AGND 16
AGND 14
CVBS_O 12
VBS_O 10
C_O 8
Y/G_O 6
Cb/B_O 4
Cr/R_O 2
AGND 29
R_IN 27
L_IN 25
Cb/B_IN 23
Y/G_IN 21
Cr/R_IN 19
Y_IN 17
C_IN 15
CVBS_IN 13
AGND 11
AGND 9
AGND 7
AGND 5
AGND 3
AGND 1
JACK PCB
KCON2
K1 10
S4 9
NC 8
KEY-IN 7
GND 6
HDD-LED 5
DVD-LED 4
PWR-LED 3
GND 2
VIDEO 1
PCN2
GND 12
GND 11
GND 10
K1(21) 9
S4(20) 8
REC_LED(19) 7
RMC(18) 6
AGND(17) 5
STB(16) 4
CLK(15) 3
DOUT(14) 2
DIN(13) 1
PCN1
AGND 12
ON/OFF2 11
ON/OFF 10
DGND 9
12V_DRV 8
V5CC 7
V5CC_25 6
V3.3 5
AL5.8 4
12VCC 3
33V 2
DGND 1
S. M. P. S
PCB
KCON1
5V 10
NC 9
NC 8
REC-LED 7
REMOCON 6
STB 5
CLK 4
DON 3
DOUT 2
AGND 1

]

MEMO

10. PCB Diagrams

10-1 S.M.P.S. PCB --- 10-2

10-2 Main PCB --- 10-4

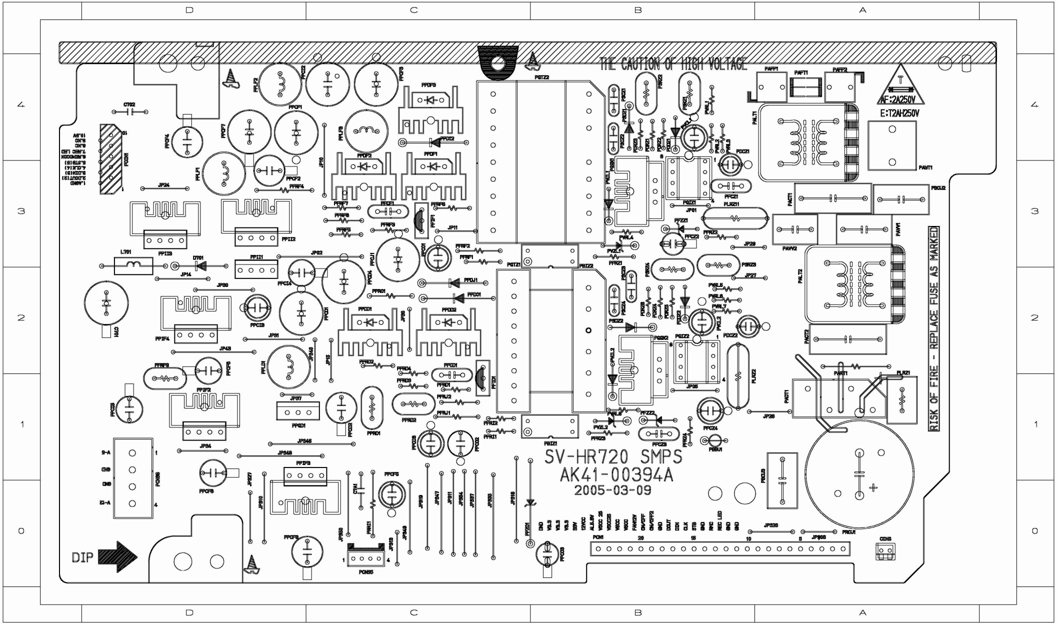
10-3 Jack PCB --- 10-6

10-4 Right Key PCB --- 10-8

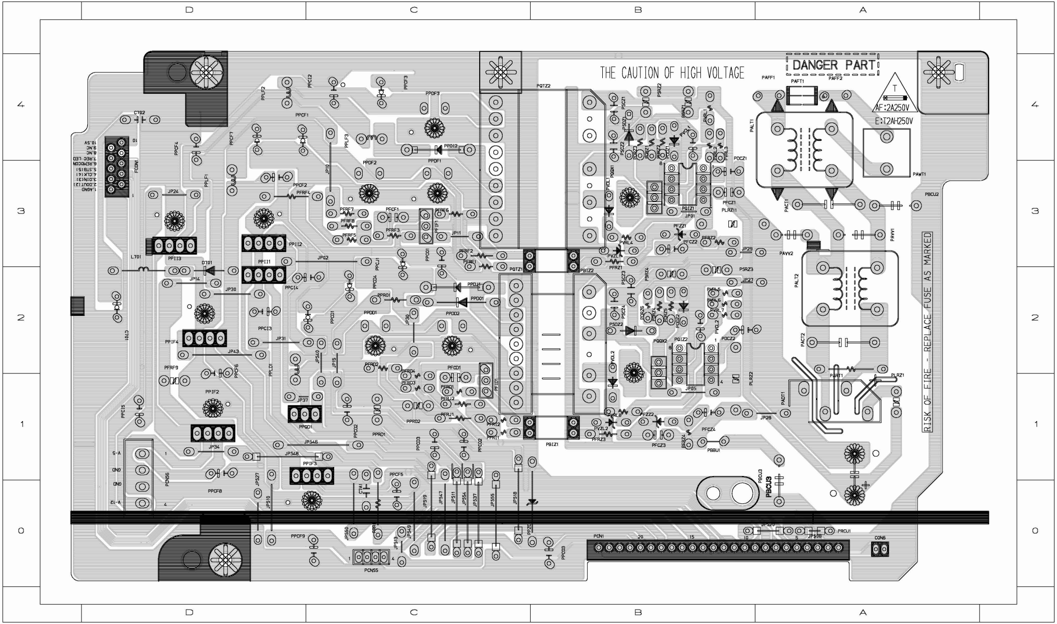
10-5 Left Key PCB --- 10-8

10-1 S.M.P.S. PCB

COMPONENT SIDE

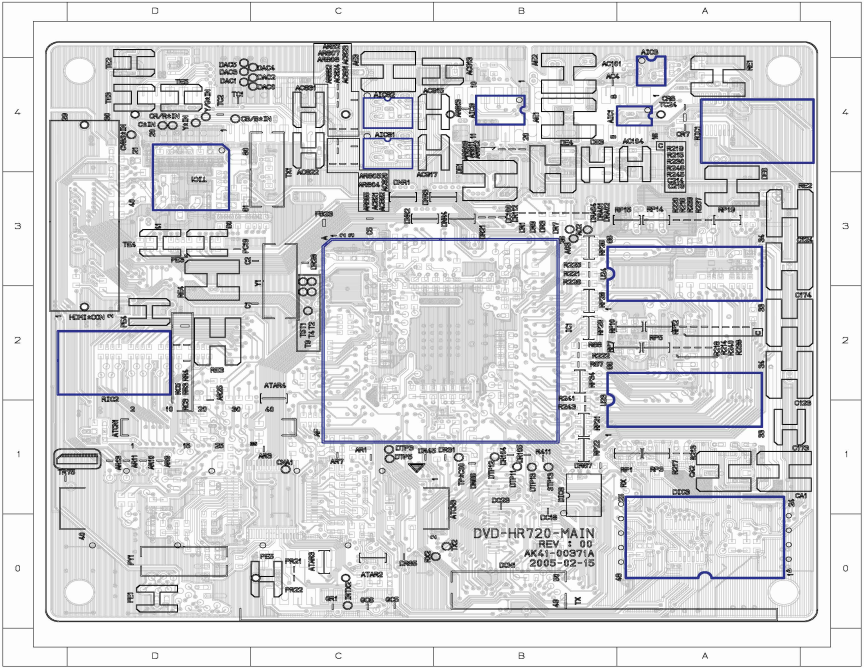

D
C
B
A
4
3
2
1
0
THE CAUTION OF HIGH VOLTAGE
AF:2A250V
E:T2AH250V
RISK OF FIRE - REPLACE FUSE AS MARKED
SV-HR720 SMPS
AK41-00394A
2005-03-09
DIP

CONDUCTOR SIDE

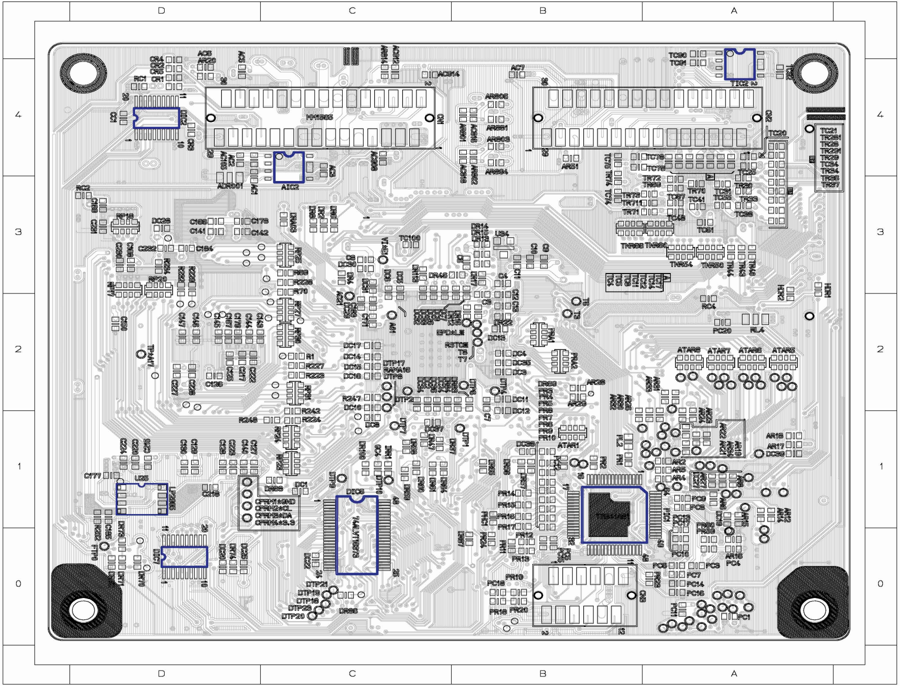

D
C
B
A
4
3
2
1
0
THE CAUTION OF HIGH VOLTAGE
DANGER PART
T
AF:2A250V
E:T2AH250V
RISK OF FIRE - REPLACE FUSE AS MARKED
PAFF1
PAFT1
PAFF2
PALT1
PAWT1
PALT2
PACT1
PACT2
PAVV1
PAVV2
PBCU2
PARTI
PLRZ1
PADT1
PBCU3
PCN1
PRCU1
CON6
PCN55
PCN56
FCON1
L701
D701
C702
C701
PQTZ1
PQTZ2
PBIZ1
PBIZ2
PQIZ1
PQIZ2
JP01
JP02
JP05
JP10
JP11
JP14
JP15
JP24
JP27
JP28
JP29
JP30
JP31
JP34
JP37
JP43
JP546
JP548
1.AGND
2.DOUT(2)
3.DIN(3)
4.CLK(4)
5.STB(5)
6.REMOCON
7.REC LED
8.NC
9.NC
10.5V
V-5
GND
GND
V-12

10-2 Main PCB

COMPONENT SIDE

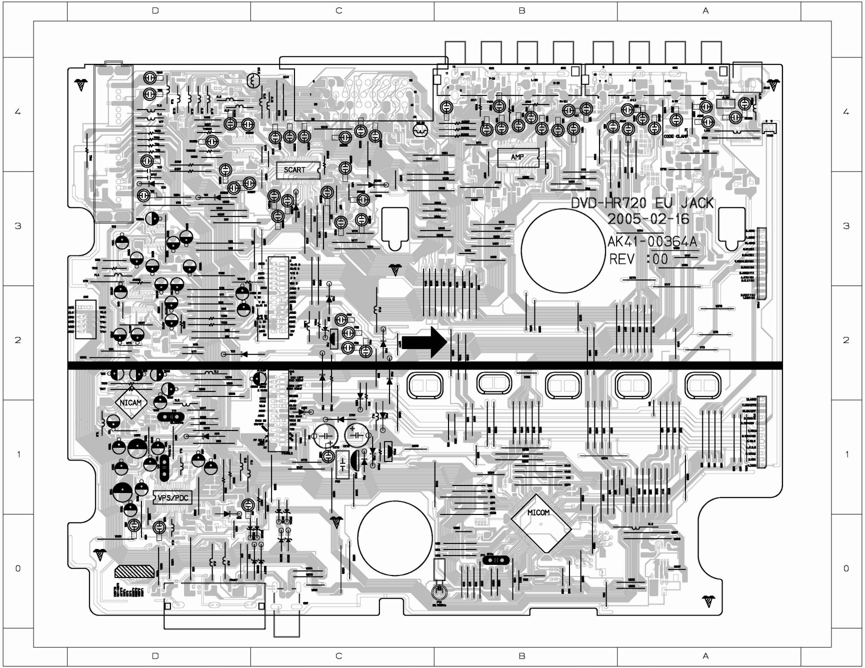

D
C
B
A
4
3
2
1
0
DVD-HR720-MAIN
REV : 00
AK41-00371A
2005-02-15
HDMI CON
RIC2
IC1
TIC1
AIC3
AIC1
AIC61
AIC62
AIC9
DIC3
RIC1
U24
U23

CONDUCTOR SIDE

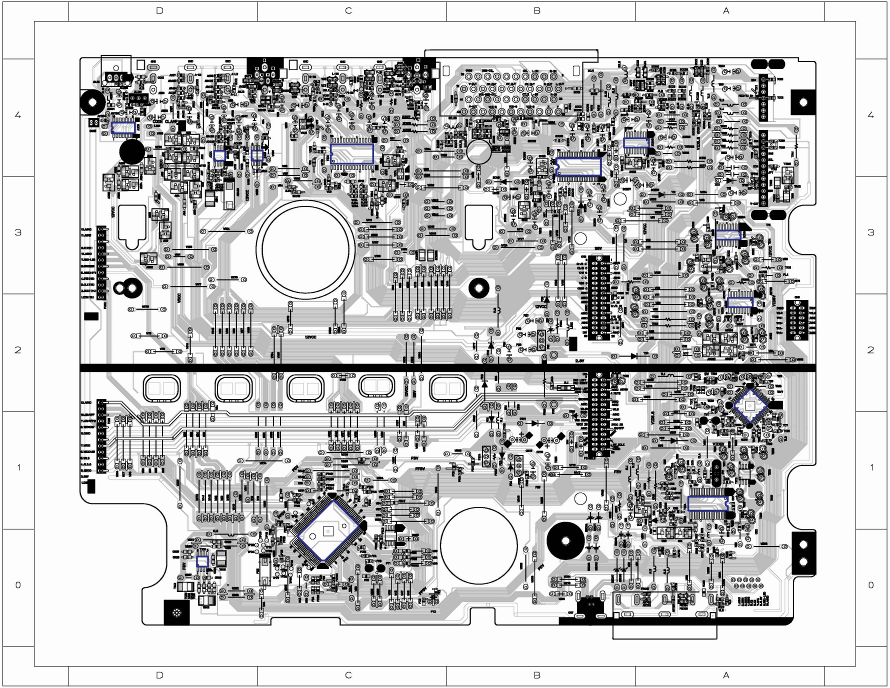

D
C
B
A
4
3
2
1
0
MM1665
AIC2
TIC2
DIC6
74ALVT16373
U25
DIC7
ATAR1
ATAR5
ATAR6
ATAR7
ATAR8
CPRM1±GND
CPRM2±CL
CPRM3±DA
CPRM4±3.3

10-3 Jack PCB

COMPONENT SIDE

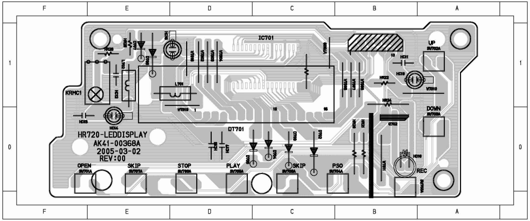

D
C
B
A
4
3
2
1
0
SCART
AMP
CODE CLAMP
DVD-HR720 EU JACK
2005-02-16
AK41-00364A
REV :00
NICAM
VPS/PDC
MICOM

CONDUCTOR SIDE

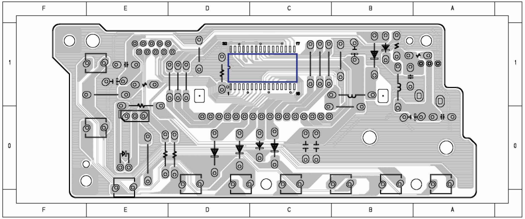


10-4 Right Key PCB

COMPONENT SIDE

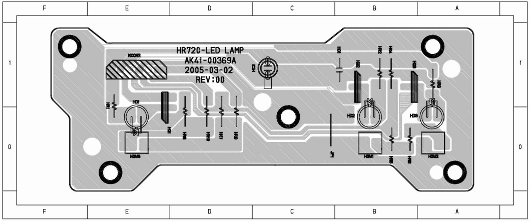

F
E
D
C
B
A
1
0
IC701
KRMC1
HR28
L701
HR22
HR24
HC11
HC10
UP
SW702A
DOWN
SW703A
DT701
Q702
HD16
REC
HR720-LEDDISPLAY
AK41-00368A
2005-03-02
REV:00
OPEN
SW701A
SKIP
SW707A
STOP
SW706A
PLAY
SW705A
SKIP
SW708A
PSO
SW704A

CONDUCTOR SIDE

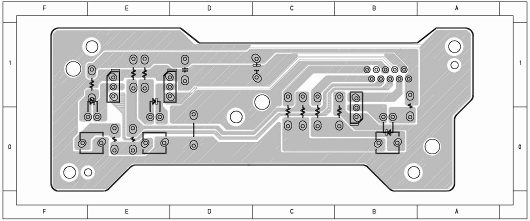


10-5 Left Key PCB

COMPONENT SIDE


F
E
D
C
B
A
1
0
HR720-LED LAMP
AK41-00369A
2005-03-02
REV:00
HD1
HD2
HD3

CONDUCTOR SIDE



11 Schematic Diagrams

11-1 S.M.P.S. (SMPS PCB) - 11-2

11-2 Main Connector (DVD PCB) - 11-3

11-3 DDR (DVD PCB) - 11-4

11-4 IEEE1394 (DVD PCB) - 11-5

11-5 A/V Codec (DVD PCB)- 11-6

11-6 Audio In/Out (DVD PCB) - 11-7

11-7 Video Decoder (DVD PCB)- 11-8

11-8 I/O (Jack PCB)- 11-9

11-9 OSD (Jack PCB)- 11-10

11-10 System Control (Jack PCB) - 11-11

11-11 TM (Jack PCB)- 11-12

11-12 A2/NICAM (Jack PCB) - 11-13

11-13 Power (Jack PCB) - 11-14

11-14 Audio Out (Jack PCB) - 11-15

11-15 Jack Connector (Jack PCB)- 11-16

11-16 AV Input Sellection (Jack PCB) - 11-17

11-17 AV Output Sellection (Jack PCB) - 11-18

11-18 Micom (Jack PCB) - 11-19

11-19 Right Key (Key PCB) - 11-20

11-20 Left Key (Key PCB) - 11-21

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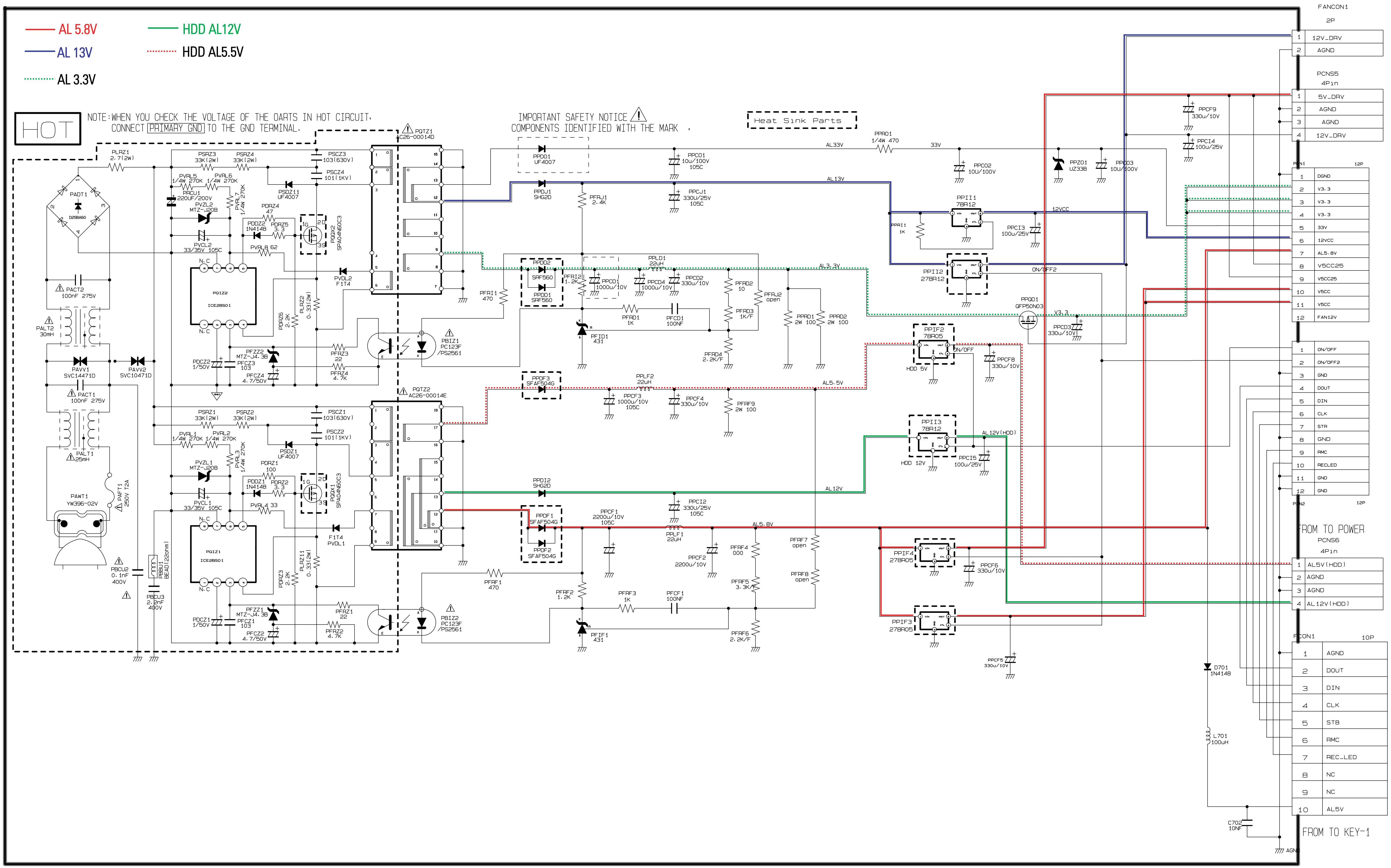
11-1 S.M.P.S. (SMPS PCB)


AL 5.8V
HDD AL12V
AL 13V
HDD AL5.5V
AL 3.3V
HOT
NOTE:WHEN YOU CHECK THE VOLTAGE OF THE OARTS IN HOT CIRCUIT,
CONNECT PRIMARY GND TO THE GND TERMINAL.
IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED WITH THE MARK
Heat Sink Parts
PQTZ1 AC26-00014D
PQTZ2 AC26-00014E
PQIZ1 ICE2BS01
PQIZ2 ICE2BS01
PQQX1 SPA04N60C3
PQQX2 SPA04N60C3
PBIZ1 PC123F /PS2561
PBIZ2 PC123F /PS2561
PADT1 D2SBA60
PAWT1 YW396-02V
PAFT1 250V T2A
PALT1 25mH
PALT2 30mH
PACT1 100nF 275V
PACT2 100nF 275V
PAVV1 SVC14471D
PAVV2 SVC10471D
PLRZ1 2.7(2W)
PPII1 78R12
PPII2 27BR12
PPII3 78R12
PPIF2 78R05
PPIF3 27BR05
PPIF4 27BR05
PPQD1 QFP50N03
HDD 5V
HDD 12V
AL33V
AL13V
AL3.3V
AL5.5V
AL12V
AL5.8V
AL12V(HDD)
12VCC
ON/OFF
ON/OFF2
V3.3
33V
FANCON1
2P
1 12V_DRV
2 AGND
PCNS5
4Pin
1 5V_DRV
2 AGND
3 AGND
4 12V_DRV
PCN1
12P
1 DGND
2 V3.3
3 V3.3
4 V3.3
5 33V
6 12VCC
7 AL5.8V
8 V5CC25
9 V5CC25
10 V5CC
11 V5CC
12 FAN12V
1 ON/OFF
2 ON/OFF2
3 GND
4 DOUT
5 DIN
6 CLK
7 STB
8 GND
9 RMC
10 RECLED
11 GND
12 GND
PCN2
12P
FROM TO POWER
PCNS6
4Pin
1 AL5V(HDD)
2 AGND
3 AGND
4 AL12V(HDD)
FCON1
10P
1 AGND
2 DOUT
3 DIN
4 CLK
5 STB
6 RMC
7 REC_LED
8 NC
9 NC
10 AL5V
FROM TO KEY-1
D701 1N4148
L701 100uH
C702 10NF
AGND

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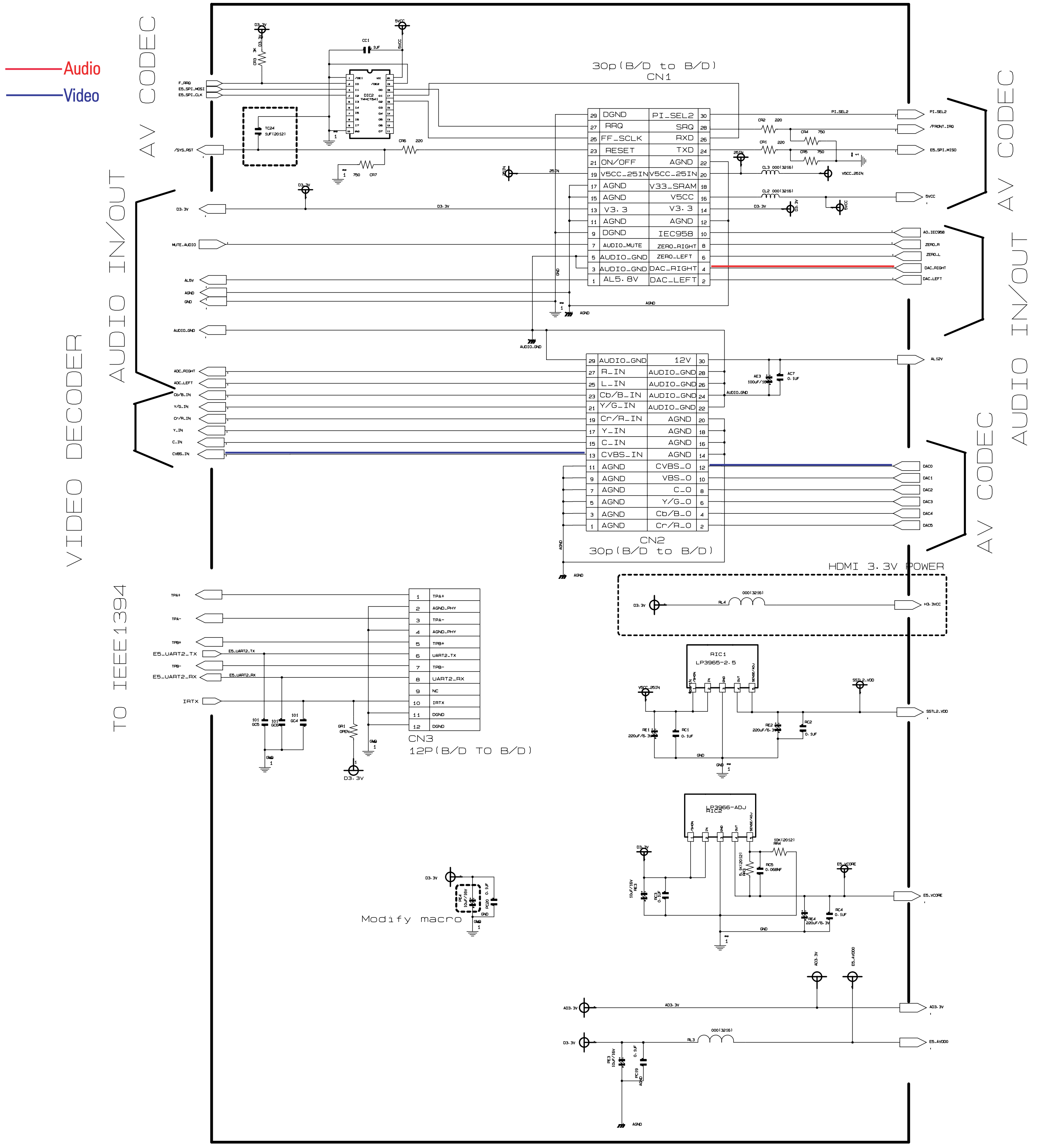
11-2 Main Connector (DVD PCB)


Audio
Video
AV CODEC
AUDIO IN/OUT
VIDEO DECODER
TO IEEE1394
30p(B/D to B/D)
CN1
29 DGND PI_SEL2 30
27 RRQ SRQ 28
25 FF_SCLK RXD 26
23 RESET TXD 24
21 ON/OFF AGND 22
19 V5CC_25IN V5CC_25IN 20
17 AGND V33_SRAM 18
15 AGND V5CC 16
13 V3.3 V3.3 14
11 AGND AGND 12
9 DGND IEC958 10
7 AUDIO_MUTE ZERO_RIGHT 8
5 AUDIO_GND ZERO_LEFT 6
3 AUDIO_GND DAC_RIGHT 4
1 AL5.8V DAC_LEFT 2
29 AUDIO_GND 12V 30
27 R_IN AUDIO_GND 28
25 L_IN AUDIO_GND 26
23 Cb/B_IN AUDIO_GND 24
21 Y/G_IN AUDIO_GND 22
19 Cr/R_IN AGND 20
17 Y_IN AGND 18
15 C_IN AGND 16
13 CVBS_IN AGND 14
11 AGND CVBS_O 12
9 AGND VBS_O 10
7 AGND C_O 8
5 AGND Y/G_O 6
3 AGND Cb/B_O 4
1 AGND Cr/R_O 2
CN2
30p(B/D to B/D)
F_RRQ
E5_SPI_MOSI
E5_SPI_CLK
/SYS_RST
D3.3V
MUTE_AUDIO
AL5V
AGND
GND
AUDIO_GND
ADC_RIGHT
ADC_LEFT
Cb/B_IN
Y/G_IN
Cr/R_IN
Y_IN
C_IN
CVBS_IN
PI_SEL2
/FRONT_IRQ
E5_SPI_MISO
5VCC
AO_IEC958
ZERO_R
ZERO_L
DAC_RIGHT
DAC_LEFT
AL12V
DAC0
DAC1
DAC2
DAC3
DAC4
DAC5
HDMI 3.3V POWER
H3.3VCC
TPA+
TPA-
TPB+
E5_UART2_TX
TPB-
E5_UART2_RX
IRTX
1 TPA+
2 AGND_PHY
3 TPA-
4 AGND_PHY
5 TPB+
6 UART2_TX
7 TPB-
8 UART2_RX
9 NC
10 IRTX
11 DGND
12 DGND
CN3
12P(B/D TO B/D)
RIC1
LP3965-2.5
SSTL2_VDD
LP3966-ADJ
RIC2
E5_VCORE
Modify macro
AD3.3V
E5_AVDD
AGND

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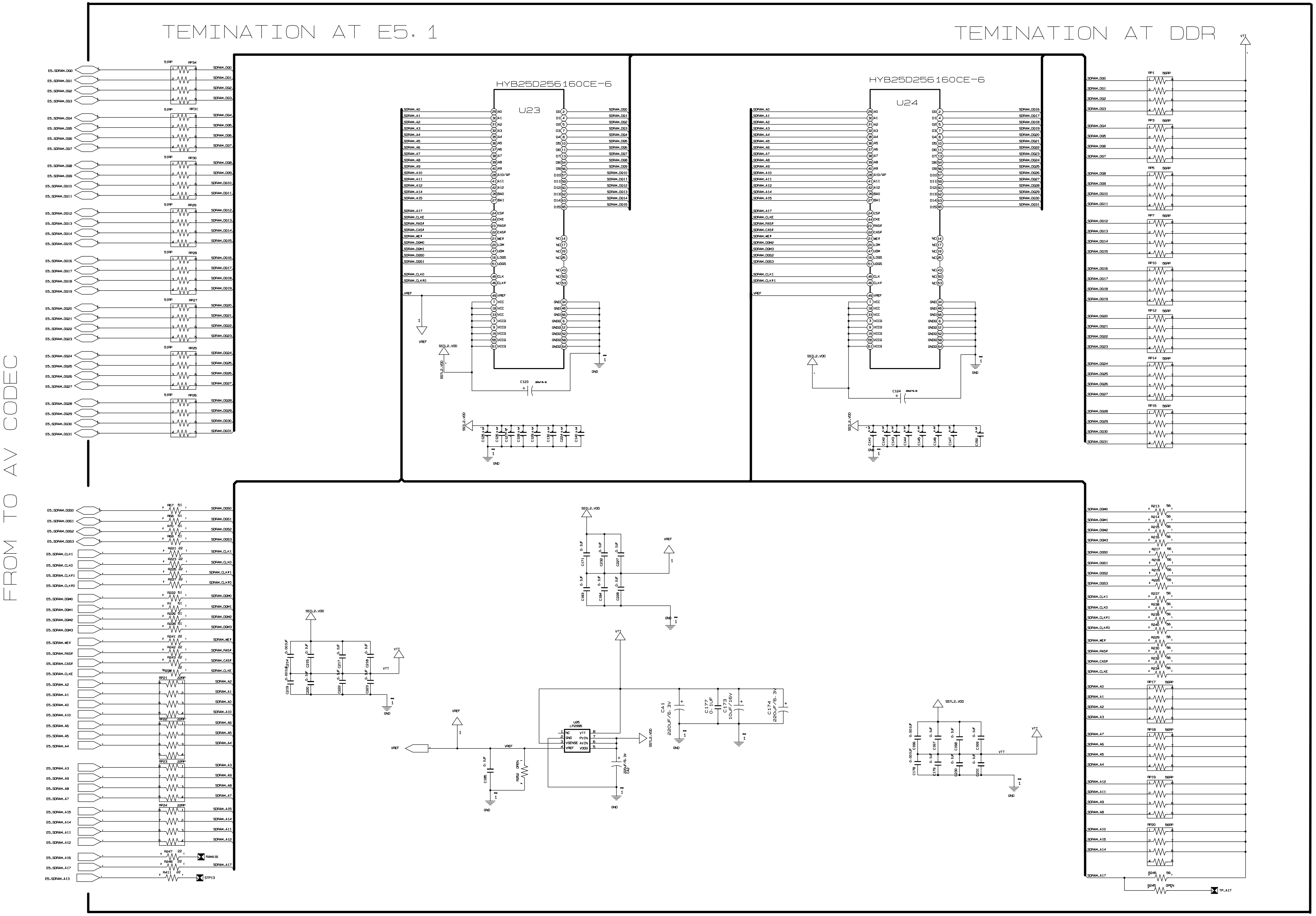
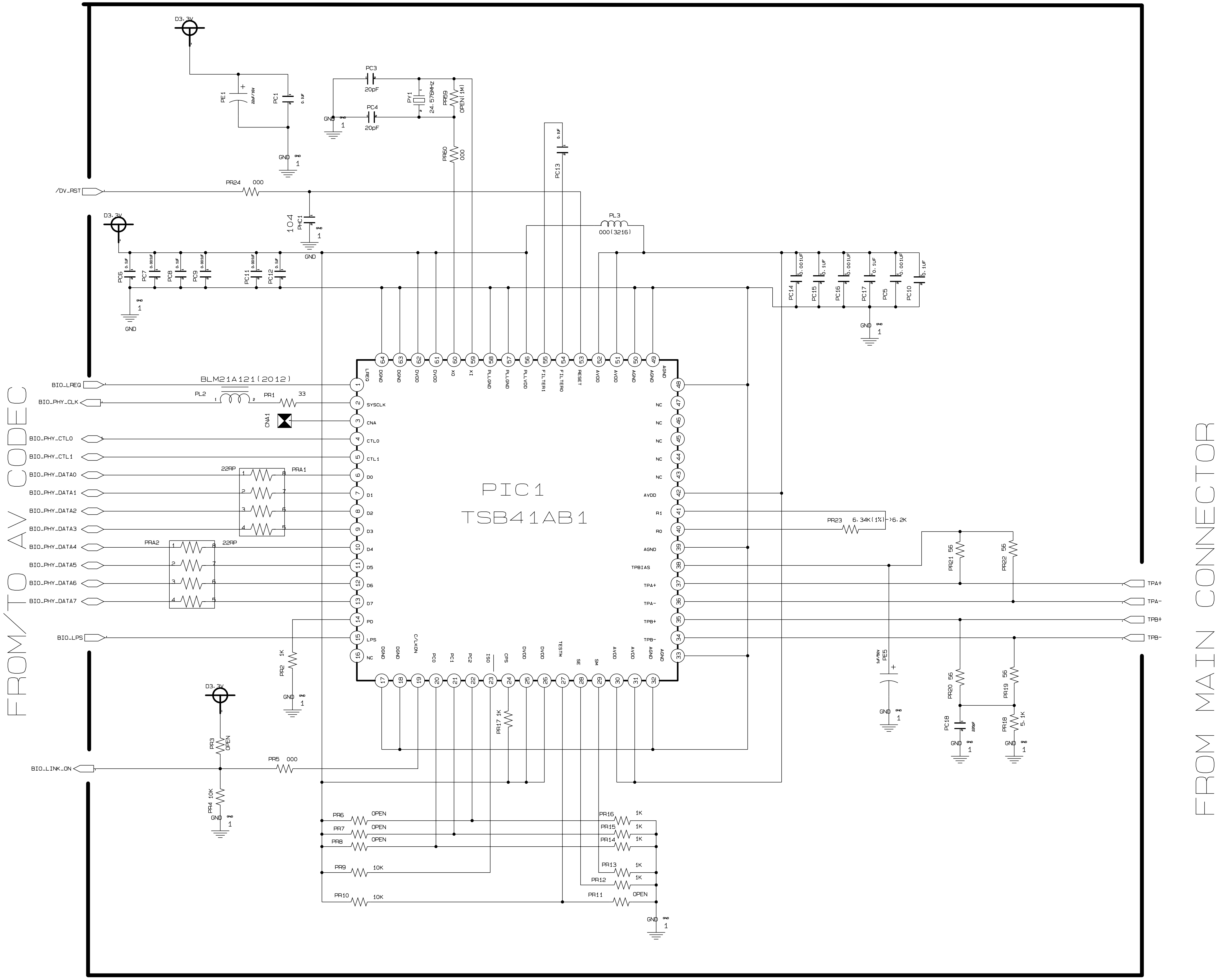
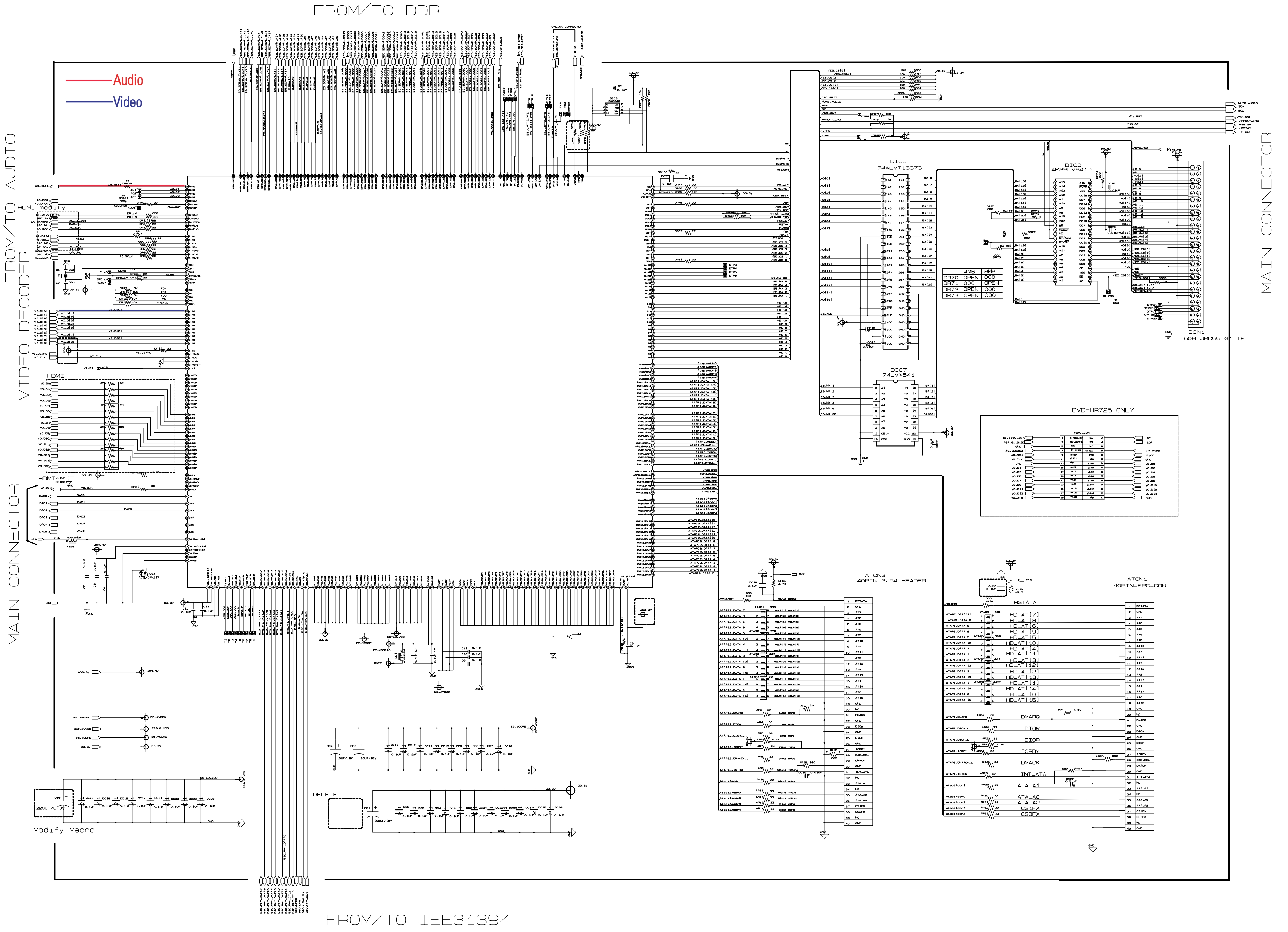
11-3 DDR (DVD PCB)


TEMINATION AT E5.1
TEMINATION AT DDR
FROM TO AV CODEC
HYB25D256160CE-6
U23
HYB25D256160CE-6
U24
U25
LP2996
SSTL2_VDD
VREF
VTT
GND
CA1
220uF/6.3V
C177
0.1uF
C173
10uF/16V
C174
220uF/6.3V

11-4 IEEE1394 (DVD PCB)


FROM/TO AV CODEC
FROM MAIN CONNECTOR
PIC1
TSB41AB1
D3.3V
PE1
22uF/16V
PC1
0.1UF
PC3
20pF
PC4
20pF
PY1
24.576MHz
PR59
OPEN(1M)
PR60
000
PC13
0.1UF
GND
/DV_RST
PR24 000
PHC1
104
PL3
000(3216)
PC6 0.1UF
PC7 0.001UF
PC8 0.1UF
PC9 0.001UF
PC11 0.001UF
PC12 0.1UF
PC14 0.001UF
PC15 0.1UF
PC16 0.001UF
PC17 0.1UF
PC5 0.001UF
PC10 0.1UF
BIO_LREQ
BIO_PHY_CLK
BLM21A121(2012)
PL2
PR1 33
CNA1
BIO_PHY_CTL0
BIO_PHY_CTL1
BIO_PHY_DATA0
BIO_PHY_DATA1
BIO_PHY_DATA2
BIO_PHY_DATA3
BIO_PHY_DATA4
BIO_PHY_DATA5
BIO_PHY_DATA6
BIO_PHY_DATA7
PRA1 22RP
PRA2 22RP
BIO_LPS
PR2 1K
BIO_LINK_ON
PR3 OPEN
PR4 10K
PR5 000
LREQ
SYSCLK
CNA
CTL0
CTL1
D0
D1
D2
D3
D4
D5
D6
D7
PD
LPS
NC
DGND
DGND
C/LKON
PC0
PC1
PC2
ISO
CPS
DVDD
DVDD
TESTM
SE
SM
AVDD
AVDD
AGND
AGND
TPB-
TPB+
TPA-
TPA+
TPBIAS
AGND
R0
R1
AVDD
NC
NC
NC
NC
NC
AGND
AGND
AGND
AVDD
AVDD
RESET
FILTER0
FILTER1
PLLVDD
PLLGND
PLLGND
XI
XO
DVDD
DVDD
DGND
DGND
PR17 1K
PR6 OPEN
PR7 OPEN
PR8 OPEN
PR9 10K
PR10 10K
PR16 1K
PR15 1K
PR14 1K
PR13 1K
PR12 1K
PR11 OPEN
PR23 6.34K(1%)->6.2K
PR21 56
PR22 56
PR20 56
PR19 56
PR18 5.1K
PC18 220pF
PE5 1uF/50V
TPA+
TPA-
TPB+
TPB-

11-5 A/V Codec (DVD PCB)


FROM/TO DDR
Audio
Video
FROM/TO AUDIO
VIDEO DECODER
HDMI modify
HDMI
MAIN CONNECTOR
DIC6
74ALVT16373
DIC3
AM29LV641DL
4MB 8MB
DR70 OPEN 000
DR71 000 OPEN
DR72 OPEN 000
DR73 OPEN 000
DIC7
74LVX541
DCN1
50A-JMD55-G1-TF
MAIN CONNECTOR
DVD-HR725 ONLY
ATCN3
40PIN_2.54_HEADER
ATCN1
40PIN_FPC_CON
DELETE
220UF/6.3V
Modify Macro
FROM/TO IEE31394

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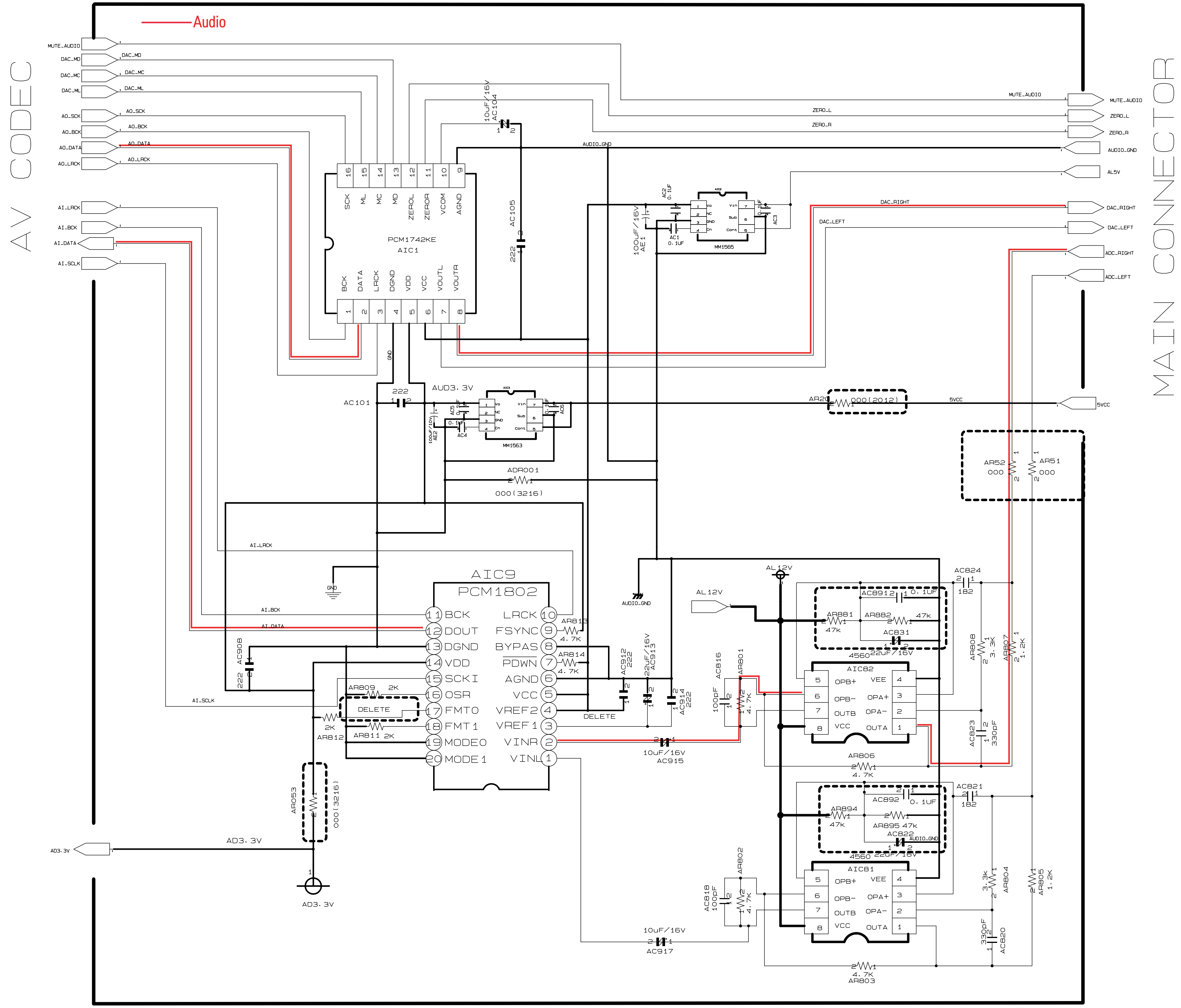
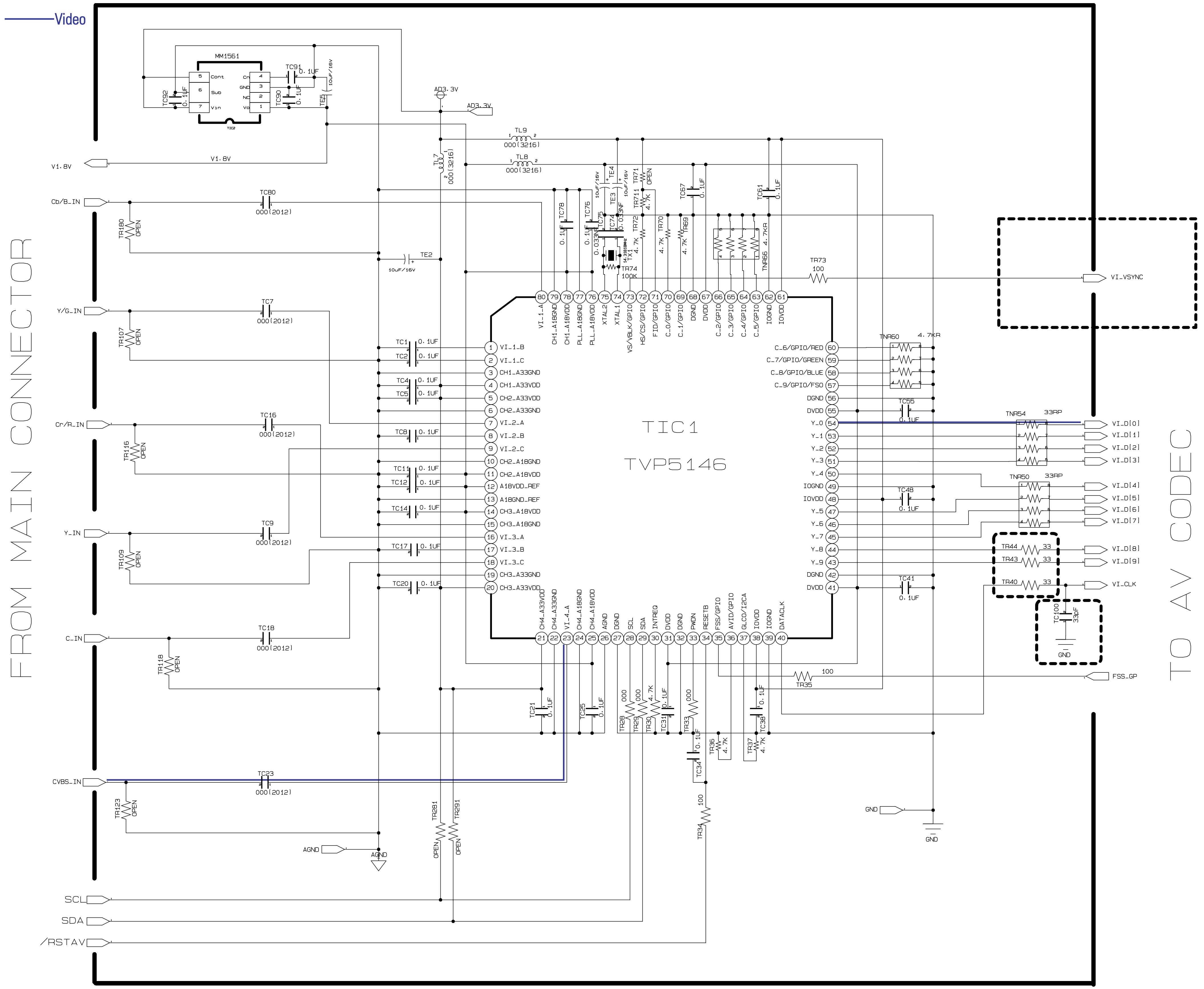
11-6 Audio In/Out (DVD PCB)


Audio
AV CODEC
MAIN CONNECTOR
MUTE_AUDIO
DAC_MD
DAC_MC
DAC_ML
AO_SCK
AO_BCK
AO_DATA
AO_LRCK
AI_LRCK
AI_BCK
AI_DATA
AI_SCLK
ZERO_L
ZERO_R
AUDIO_GND
AL5V
DAC_RIGHT
DAC_LEFT
ADC_RIGHT
ADC_LEFT
5VCC
PCM1742KE
AIC1
SCK ML MC MD ZEROL ZEROR VCOM AGND
BCK DATA LRCK DGND VDD VCC VOUTL VOUTR
10uF/16V AC104
AC105 222
100uF/16V AE1
AC2 0.1uF
AC1 0.1uF
AC3
MM1565
AC101 222
AUD3.3V
AC5 0.1uF
100uF/10V AE2
AC4
AC6
MM1563
AR20 000(2012)
ADR001 000(3216)
AR52 000
AR51 000
AIC9
PCM1802
BCK DOUT DGND VDD SCKI OSR FMT0 FMT1 MODE0 MODE1
LRCK FSYNC BYPAS PDWN AGND VCC VREF2 VREF1 VINR VINL
AR813 4.7K
AR814 4.7K
AR809 2K
DELETE
AR812 2K
AR811 2K
AC908 222
AC912 222
22uF/16V AC913
AC914 222
10uF/16V AC915
AC917 10uF/16V
GND
AR053 000(3216)
AD3.3V
AL12V
AC816 100pF
AR801 4.7K
AC818 100pF
AR802 4.7K
AC824 182
AC8912 0.1UF
AR881 47K
AR882 47K
AC831
4560 22uF/16V
AIC82
OPB+ VEE OPB- OPA+ OUTB OPA- VCC OUTA
AR808 3.3K
AR807 1.2K
AC823 330pF
AR806 4.7K
AC821 182
AC892 0.1UF
AR894 47K
AR895 47K
AC822
4560 22uF/16V
AIC81
AR804 3.3K
AR805 1.2K
AC820 330pF
AR803 4.7K

11-7 Video Decoder (DVD PCB)


Video
FROM MAIN CONNECTOR
TO AV CODEC
TIC1
TVP5146
MM1561
Cont
Sub
Vin
Cr
GND
NC
Vo
TC91 0.1UF
TC92 0.1UF
TC90 0.1UF
TE5 10uF/16V
AD3.3V
V1.8V
Cb/B_IN
Y/G_IN
Cr/R_IN
Y_IN
C_IN
CVBS_IN
TR180 OPEN
TR107 OPEN
TR116 OPEN
TR109 OPEN
TR118 OPEN
TR123 OPEN
TC80 000(2012)
TC7 000(2012)
TC16 000(2012)
TC9 000(2012)
TC18 000(2012)
TC23 000(2012)
TE2 10uF/16V
TL9 000(3216)
TL8 000(3216)
TL7 000(3216)
TC1 0.1UF
TC2 0.1UF
TC4 0.1UF
TC5 0.1UF
TC8 0.1UF
TC11 0.1UF
TC12 0.1UF
TC14 0.1UF
TC17 0.1UF
TC20 0.1UF
VI_1_B
VI_1_C
CH1_A33GND
CH1_A33VDD
CH2_A33VDD
CH2_A33GND
VI_2_A
VI_2_B
VI_2_C
CH2_A18GND
CH2_A18VDD
A18VDD_REF
A18GND_REF
CH3_A18VDD
CH3_A18GND
VI_3_A
VI_3_B
VI_3_C
CH3_A33GND
CH3_A33VDD
VI_1_A
CH1_A18GND
CH1_A18VDD
PLL_A18GND
PLL_A18VDD
XTAL2
XTAL1
VS/VBLK/GPIO
HS/CS/GPIO
FID/GPIO
C_0/GPIO
C_1/GPIO
DGND
DVDD
C_2/GPIO
C_3/GPIO
C_4/GPIO
C_5/GPIO
IOGND
IOVDD
C_6/GPIO/RED
C_7/GPIO/GREEN
C_8/GPIO/BLUE
C_9/GPIO/FSO
Y_0
Y_1
Y_2
Y_3
Y_4
Y_5
Y_6
Y_7
Y_8
Y_9
CH4_A33VDD
CH4_A33GND
VI_4_A
CH4_A18GND
CH4_A18VDD
AGND
SCL
SDA
INTREQ
PWDN
RESETB
FSS/GPIO
AVID/GPIO
GLCO/I2CA
DATACLK
TC78 0.1UF
TC76 0.1UF
TC75
TC74 0.033NF
TE4 10uF/16V
TE3 10uF/16V
X1 14.31818MHz
TR74 100K
TR72 4.7K
TR71 OPEN
TR711 4.7K
TR70 4.7K
TR69 4.7K
TC67 0.1UF
TC61 0.1UF
TNR66 4.7KR
TR73 100
VI_VSYNC
TNR60 4.7KR
TC55 0.1UF
TC48 0.1UF
TC41 0.1UF
TNR54 33RP
TNR50 33RP
VI_D[0]
VI_D[1]
VI_D[2]
VI_D[3]
VI_D[4]
VI_D[5]
VI_D[6]
VI_D[7]
VI_D[8]
VI_D[9]
VI_CLK
TR44 33
TR43 33
TR40 33
TC100 33PF
GND
FSS_GP
TR35 100
TC21 0.1UF
TC25 0.1UF
TR28 000
TR29 000
TR30 4.7K
TC31 0.1UF
TR33 000
TC34 0.1UF
TR36 4.7K
TR37 4.7K
TC38 0.1UF
TR34 100
TR281 OPEN
TR291 OPEN
AGND
SCL
SDA
/RSTAV

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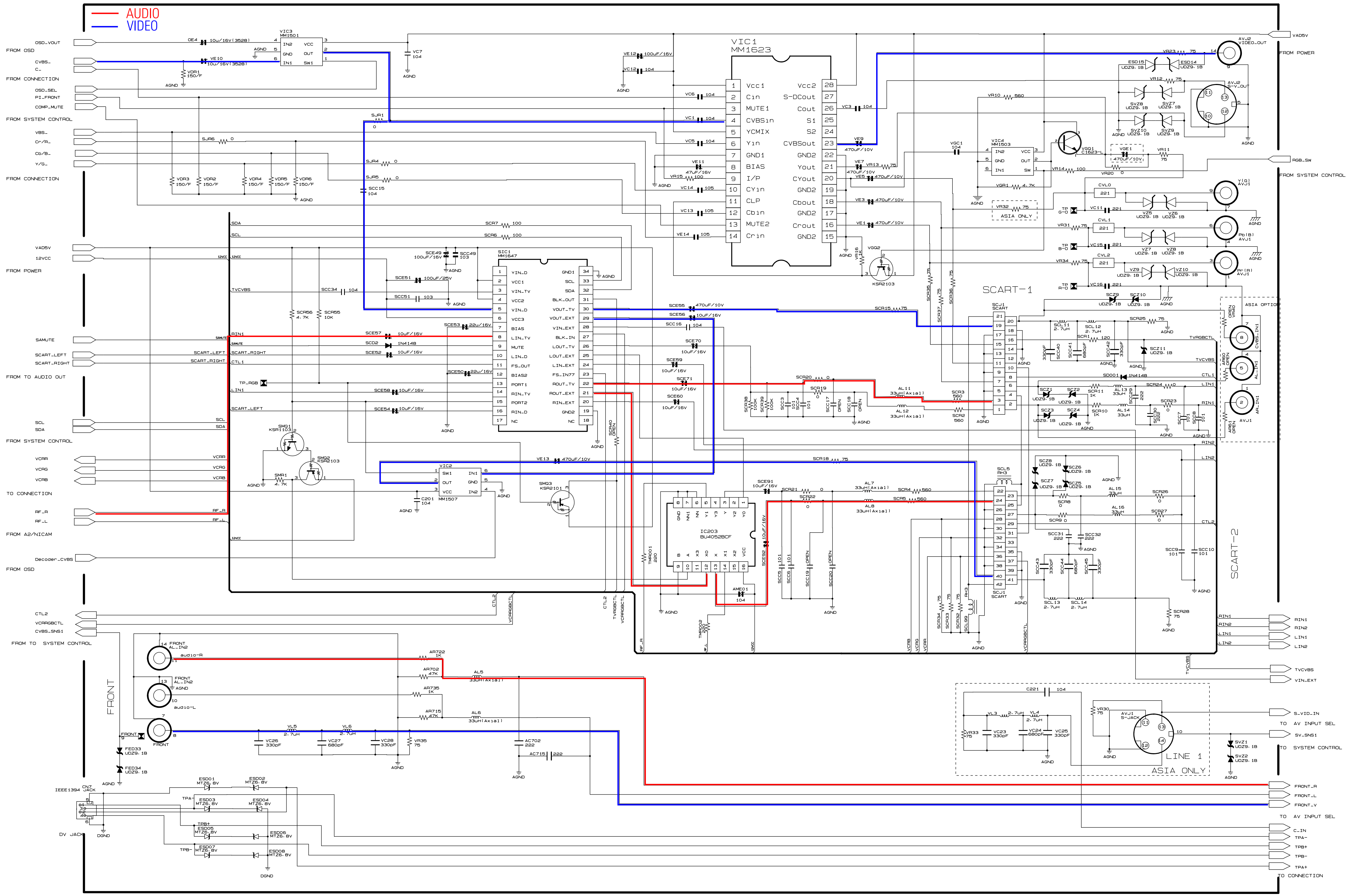
11-8 I/O (Jack PCB)


AUDIO
VIDEO
FROM OSD
OSD_VOUT
CVBS_
C_
FROM CONNECTION
OSD_SEL
PI_FRONT
COMP_MUTE
FROM SYSTEM CONTROL
VBS_
Cr/R_
Cb/B_
Y/G_
FROM CONNECTION
VAD5V
12VCC
FROM POWER
SAMUTE
SCART_LEFT
SCART_RIGHT
FROM TO AUDIO OUT
SCL
SDA
FROM SYSTEM CONTROL
VCRR
VCRG
VCRB
TO CONNECTION
RF_R
RF_L
FROM A2/NICAM
Decoder_CVBS
FROM OSD
CTL2
VCRRGBCTL
CVBS_SNS1
FROM TO SYSTEM CONTROL
VIC3 MM1501
VIC1 MM1623
Vcc1
Cin
MUTE1
CVBSin
YCMIX
Yin
GND1
BIAS
I/P
CYin
CLP
Cbin
MUTE2
Crin
Vcc2
S-DCout
Cout
S1
S2
CVBSout
GND2
Yout
CYout
Cbout
Crout
SIC1 MM1647
VIC2 MM1507
VIC4 MM1503
IC203 BU4052BCF
SMG1 KSR1103
SMG2 KSR2103
SMG3 KSR2101
VGG1 C1623-L
VGG2 KSR2103
SCART-1
SCART-2
ASIA OPTION
ASIA ONLY
AVJ2 VIDEO_OUT
AVJ2 S-V_OUT
Y(G) AVJ1
Pb(B) AVJ1
Pr(R) AVJ1
AVJ1 S-JACK
LINE 1
ASIA ONLY
FRONT
FRONT AL_IN2
FRONT AL_IN2
audio-R
audio-L
IEEE1394 JACK
DV JACK
DGND
AGND
VAD5V
FROM POWER
RGB_SW
FROM SYSTEM CONTROL
RIN1
RIN2
LIN1
LIN2
TVCVBS
VIN_EXT
S_VID_IN
TO AV INPUT SEL
SV_SNS1
TO SYSTEM CONTROL
FRONT_R
FRONT_L
FRONT_V
TO AV INPUT SEL
C_IN
TPA-
TPB+
TPB-
TPA+
TO CONNECTION

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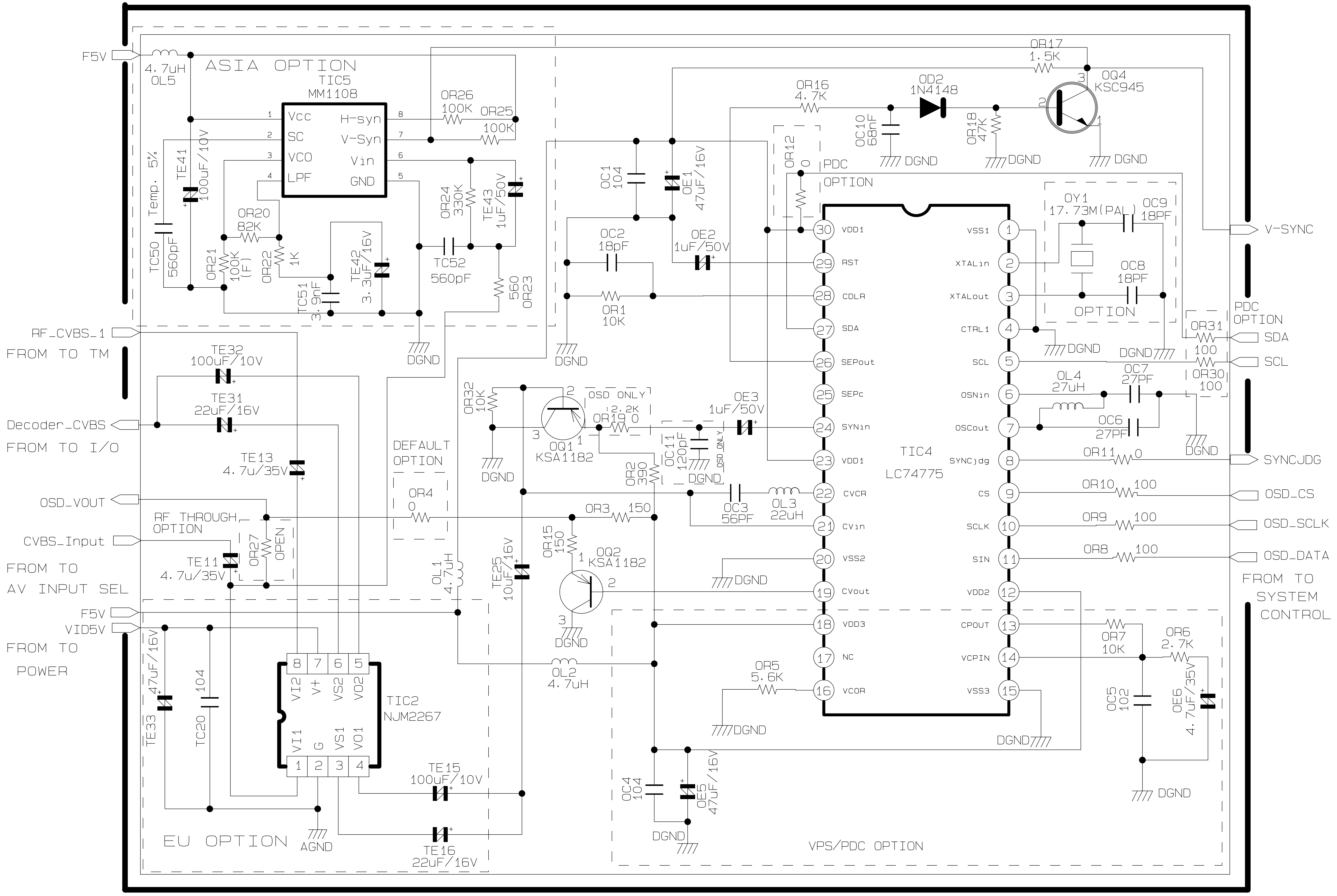
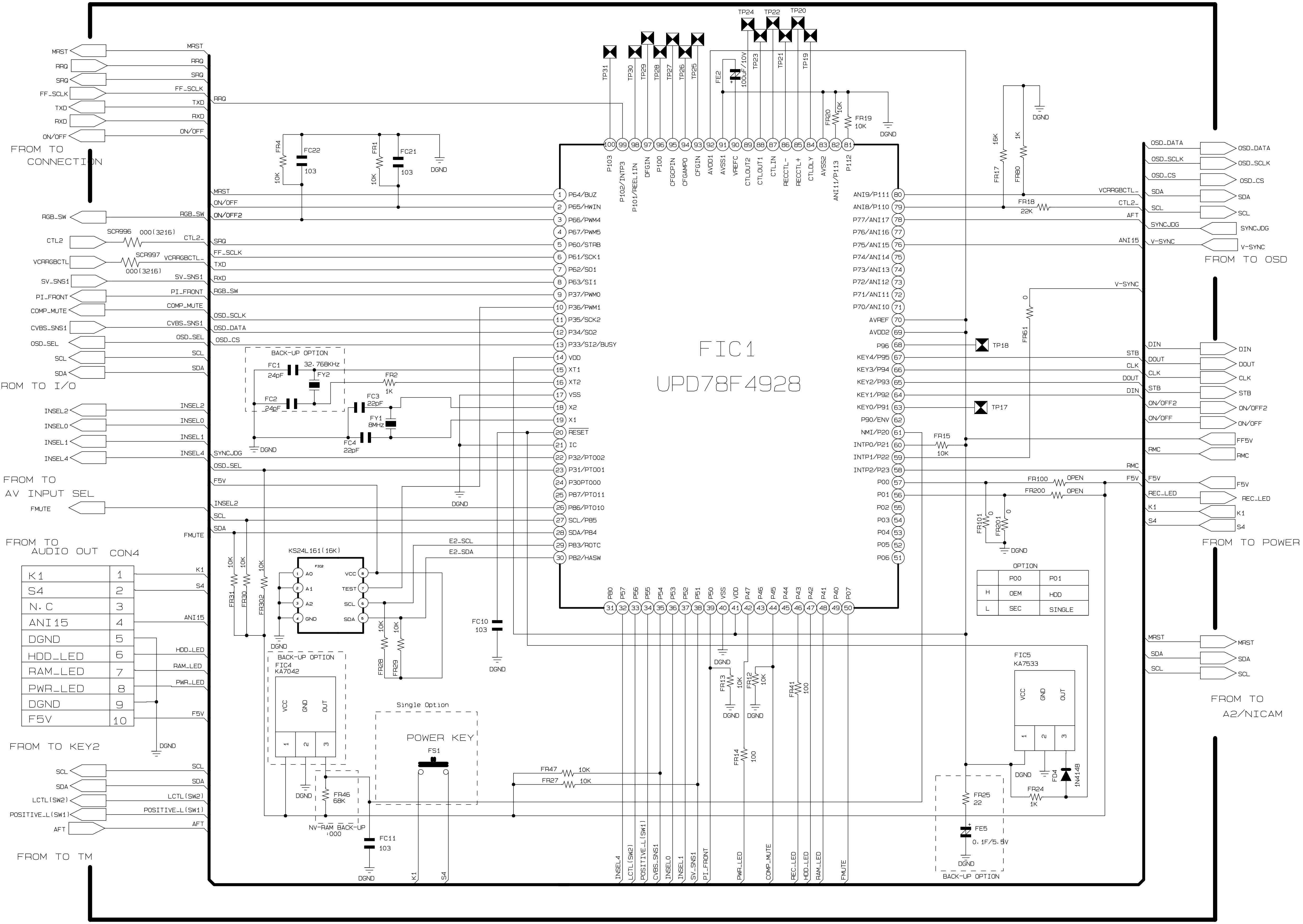
11-9 OSD (Jack PCB)


F5V
4.7uH
OL5
ASIA OPTION
TIC5
MM1108
Vcc
SC
VCO
LPF
H-syn
V-Syn
Vin
GND
OR26
100K
OR25
100K
Temp. 5%
TE41
100uF/10V
TC50
560pF
OR20
82K
OR21
100K
(F)
OR22
1K
TC51
3.9nF
TE42
3.3uF/16V
TC52
560pF
OR24
330K
TE43
1uF/50V
560
OR23
DGND
RF_CVBS_1
FROM TO TM
TE32
100uF/10V
TE31
22uF/16V
Decoder_CVBS
FROM TO I/O
TE13
4.7u/35V
OSD_VOUT
RF THROUGH
OPTION
OR27
OPEN
CVBS_Input
TE11
4.7u/35V
FROM TO
AV INPUT SEL
F5V
VID5V
FROM TO
POWER
TE33
47uF/16V
TC20
104
TIC2
NJM2267
VI2
V+
VS2
VO2
VI1
G
VS1
VO1
TE15
100uF/10V
TE16
22uF/16V
EU OPTION
AGND
DEFAULT
OPTION
OR4
0
OL1
4.7uH
TE25
10uF/16V
OR32
10K
OQ1
KSA1182
OSD ONLY
:2.2K
OR19 0
OR2
390
OC11
120pF
OSD ONLY
OR3 150
OR15
150
OQ2
KSA1182
OL2
4.7uH
OC1
104
TE1
47uF/16V
OC2
18pF
OE2
1uF/50V
OR1
10K
OE3
1uF/50V
OC3
56PF
OL3
22uH
OC4
104
OE5
47uF/16V
OR5
5.6K
VPS/PDC OPTION
OR16
4.7K
OC10
68nF
OD2
1N4148
OR18
47K
OR17
1.5K
OQ4
KSC945
OR12
0
PDC
OPTION
TIC4
LC74775
VDD1
RST
CDLR
SDA
SEPout
SEPc
SYNin
VDD1
CVCR
CVin
VSS2
CVout
VDD3
NC
VCOR
VSS1
XTALin
XTALout
CTRL1
SCL
OSNin
OSCout
SYNCjdg
CS
SCLK
SIN
VDD2
CPOUT
VCPIN
VSS3
OY1
17.73M(PAL)
OC9
18PF
OC8
18PF
OPTION
OL4
27uH
OC7
27PF
OC6
27PF
OR11 0
OR10 100
OR9 100
OR8 100
OR7
10K
OR6
2.7K
OC5
102
OE6
4.7uF/35V
OR31
100
OR30
100
PDC
OPTION
V-SYNC
SDA
SCL
SYNCJDG
OSD_CS
OSD_SCLK
OSD_DATA
FROM TO
SYSTEM
CONTROL

11-10 System Control (Jack PCB)


FIC1
UPD78F4928
FROM TO CONNECTION
FROM TO I/O
FROM TO AV INPUT SEL
FROM TO AUDIO OUT
CON4
FROM TO KEY2
FROM TO TM
FROM TO OSD
FROM TO POWER
FROM TO A2/NICAM
MRST
RRQ
SRQ
FF_SCLK
TXD
RXD
ON/OFF
ON/OFF2
RGB_SW
CTL2
CTL2_
SCR996 000(3216)
SCR997 000(3216)
VCRRGBCTL
VCRRGBCTL_
SV_SNS1
PI_FRONT
COMP_MUTE
CVBS_SNS1
OSD_SEL
OSD_SCLK
OSD_DATA
OSD_CS
SCL
SDA
INSEL2
INSEL0
INSEL1
INSEL4
SYNCJDG
F5V
FMUTE
K1
S4
N.C
ANI15
DGND
HDD_LED
RAM_LED
PWR_LED
LCTL(SW2)
POSITIVE_L(SW1)
AFT
1 P64/BUZ
2 P65/HWIN
3 P66/PWM4
4 P67/PWM5
5 P60/STRB
6 P61/SCK1
7 P62/SO1
8 P63/SI1
9 P37/PWM0
10 P36/PWM1
11 P35/SCK2
12 P34/SO2
13 P33/SI2/BUSY
14 VDD
15 XT1
16 XT2
17 VSS
18 X2
19 X1
20 RESET
21 IC
22 P32/PTO02
23 P31/PTO01
24 P30PTO00
25 P87/PTO11
26 P86/PTO10
27 SCL/P85
28 SDA/P84
29 P83/ROTC
30 P82/HASW
80 ANI9/P111
79 ANI8/P110
78 P77/ANI17
77 P76/ANI16
76 P75/ANI15
75 P74/ANI14
74 P73/ANI13
73 P72/ANI12
72 P71/ANI11
71 P70/ANI10
70 AVREF
69 AVDD2
68 P96
67 KEY4/P95
66 KEY3/P94
65 KEY2/P93
64 KEY1/P92
63 KEY0/P91
62 P90/ENV
61 NMI/P20
60 INTP0/P21
59 INTP1/P22
58 INTP2/P23
57 P00
56 P01
55 P02
54 P03
53 P04
52 P05
51 P06
100 P103
99 P102/INTP3
98 P101/REEL1IN
97 DFGIN
96 P100
95 CFGCPIN
94 CFGAMPO
93 CFGIN
92 AVDD1
91 AVSS1
90 VREFC
89 CTLOUT2
88 CTLOUT1
87 CTLIN
86 RECCTL-
85 RECCTL+
84 CTLDLY
83 AVSS2
82 ANI11/P113
81 P112
31 P80
32 P57
33 P56
34 P55
35 P54
36 P53
37 P52
38 P51
39 P50
40 VSS
41 VDD
42 P47
43 P46
44 P45
45 P44
46 P43
47 P42
48 P41
49 P40
50 P07
TP31 TP30 TP29 TP28 TP27 TP26 TP25 TP24 TP23 TP22 TP21 TP20 TP19 TP18 TP17
FE2 100uF/10V
FR20 10K
FR19 10K
FR17 16K
FR80 1K
FR18 22K
FR61 0
FR15 10K
FR100 OPEN
FR200 OPEN
FR101 0
FR201 0
FR4 10K
FC22 103
FR1 10K
FC21 103
BACK-UP OPTION
FC1 24pF
32.768KHz
FY2
FC2 24pF
FR2 1K
FC3 22pF
FY1 8MHz
FC4 22pF
KS24L161(16K)
FIC2
A0 A1 A2 GND VCC TEST SCL SDA
FR31 10K
FR30 10K
FR302 10K
FR28 10K
FR29 10K
E2_SCL
E2_SDA
FC10 103
FIC4 KA7042
VCC GND OUT
FR46 68K
NV-RAM BACK-UP :000
FC11 103
Single Option
POWER KEY
FS1
FR47 10K
FR27 10K
FR13 10K
FR12 10K
FR41 100
FR14 100
FIC5 KA7533
FD4 1N4148
FR24 1K
FR25 22
FE5 0.1F/5.5V
STB
CLK
DOUT
DIN
RMC
REC_LED
FF5V
V-SYNC
SYNCJDG
OSD_DATA
OSD_SCLK
OSD_CS
SDA
SCL
OPTION
P00 P01
H OEM HDD
L SEC SINGLE

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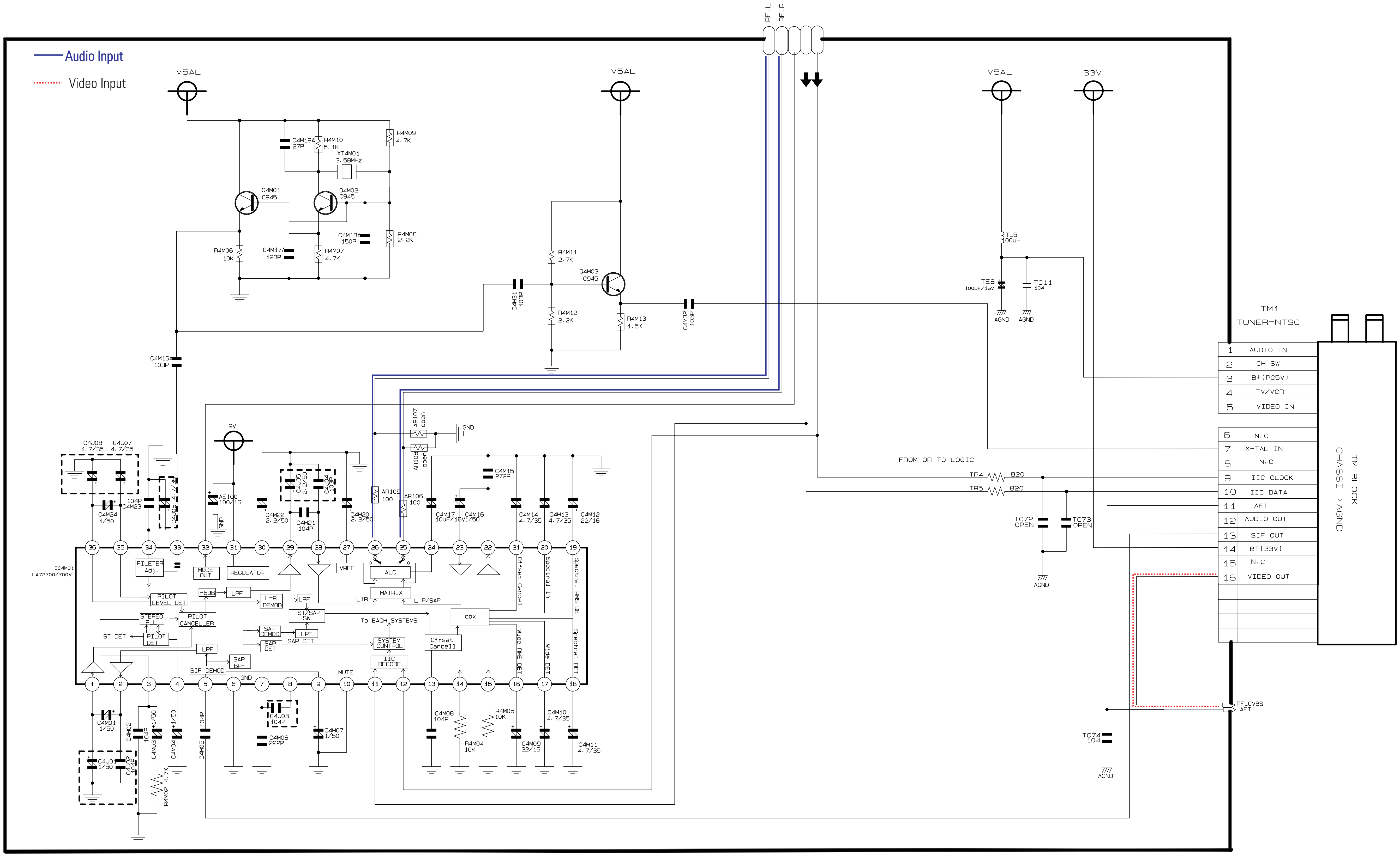
11-11 TM (Jack PCB)


Audio Input
Video Input
RF_L
RF_R
V5AL
V5AL
V5AL
33V
C4M19A 27P
R4M10 5.1K
XT4M01 3.58MHz
R4M09 4.7K
Q4M01 C945
Q4M02 C945
C4M18A 150P
R4M08 2.2K
R4M06 10K
C4M17A 123P
R4M07 4.7K
C4M16A 103P
C4M31 103P
R4M11 2.7K
Q4M03 C945
R4M12 2.2K
R4M13 1.5K
C4M32 103P
TL5 100uH
TE8 100uF/16V
TC11 104
AGND
AGND
TM1
TUNER-NTSC
1 AUDIO IN
2 CH SW
3 B+(PC5V)
4 TV/VCR
5 VIDEO IN
6 N.C
7 X-TAL IN
8 N.C
9 IIC CLOCK
10 IIC DATA
11 AFT
12 AUDIO OUT
13 SIF OUT
14 BT(33V)
15 N.C
16 VIDEO OUT
TM BLOCK CHASSI->AGND
FROM OR TO LOGIC
TR4 820
TR5 820
TC72 OPEN
TC73 OPEN
AGND
RF_CVBS
AFT
TC74 104
AGND
9V
GND
AR107 open
AR108 open
AR105 100
AR106 100
C4J08 4.7/35
C4J07 4.7/35
C4M24 1/50
104P C4M23
C4J06 4.7/35
AE100 100/16
C4M22 2.2/50
C4J05 2.2/50
C4J04 103P
C4M21 104P
C4M20 2.2/50
C4M17 10uF/16V
C4M16 1/50
C4M15 272P
C4M14 4.7/35
C4M13 4.7/35
C4M12 22/16
IC4M01 LA72700/700V
FILETER Adj.
MODE OUT
REGULATOR
VREF
ALC
MATRIX
L+R
L-R/SAP
PILOT LEVEL DET
-6dB
LPF
L-R DEMOD
LPF
ST/SAP SW
To EACH SYSTEMS
dbx
STEREO PLL
PILOT CANCELLER
ST DET
PILOT DET
SAP DEMOD
LPF
SAP DET
SAP DET
SYSTEM CONTROL
Offsat Cancell
LPF
SAP BPF
SIF DEMOD
GND
MUTE
IIC DECODE
Offset Cancel
Spectral In
Spectral RMS DET
Wide RMS DET
Wide DET
Spectral DET
36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
C4M01 1/50
C4J01 1/50
C4J02 104P
C4M02 104P
C4M03 1/50
C4M04 1/50
R4M02 4.7K
C4M05 104P
C4J03 104P
C4M06 222P
C4M07 1/50
C4M08 104P
R4M04 10K
R4M05 10K
C4M09 22/16
C4M10 4.7/35
C4M11 4.7/35

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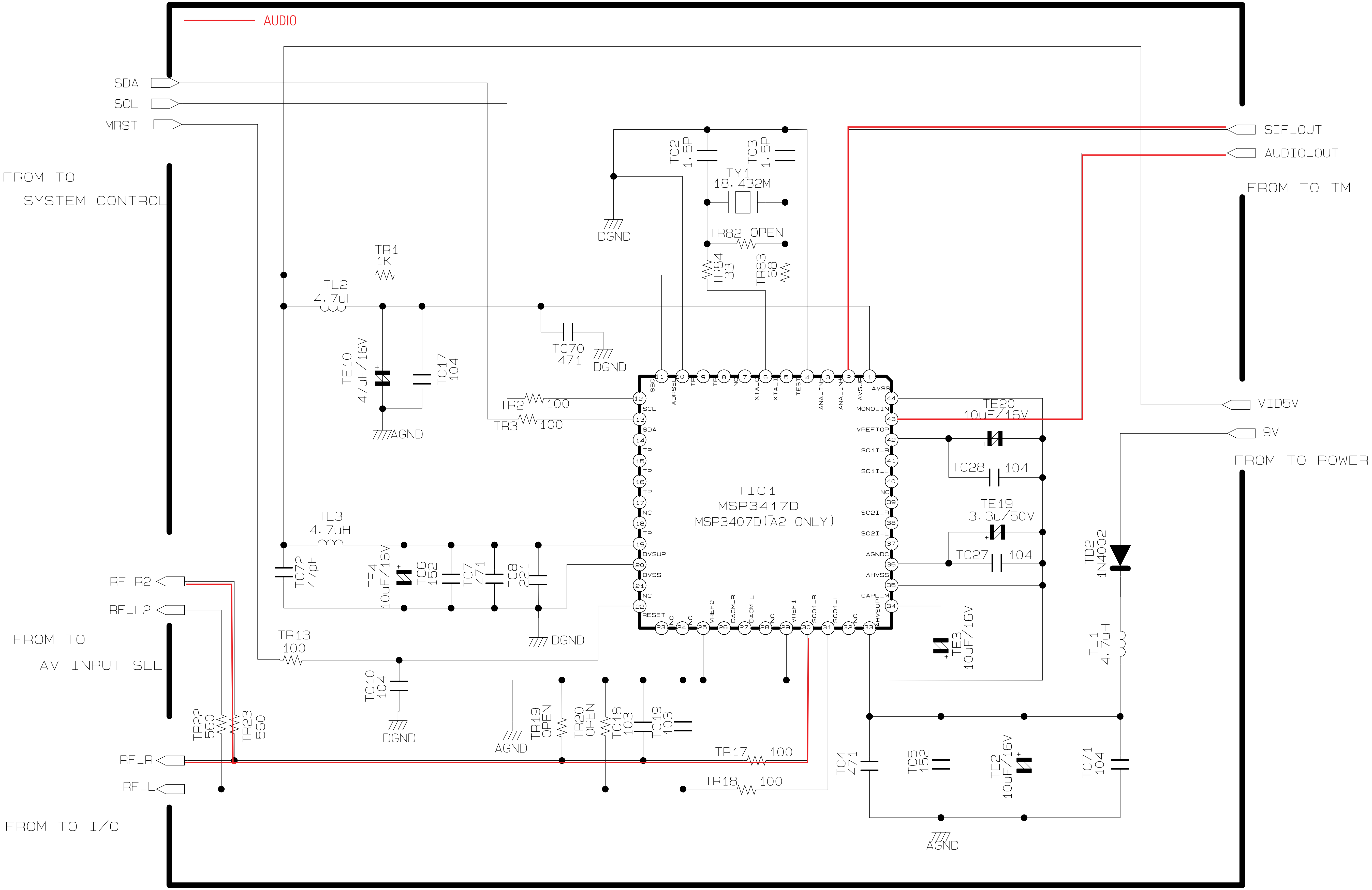
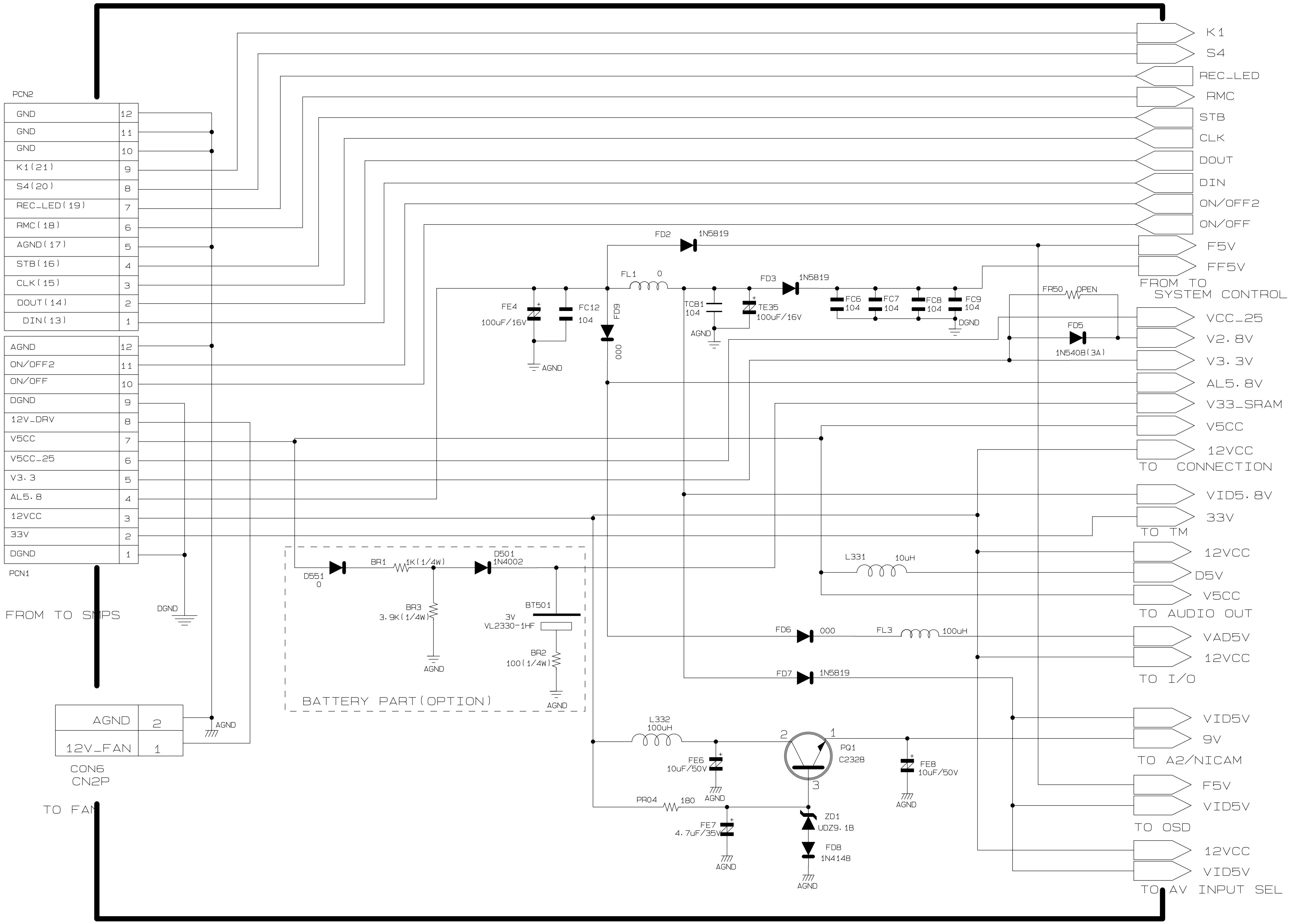
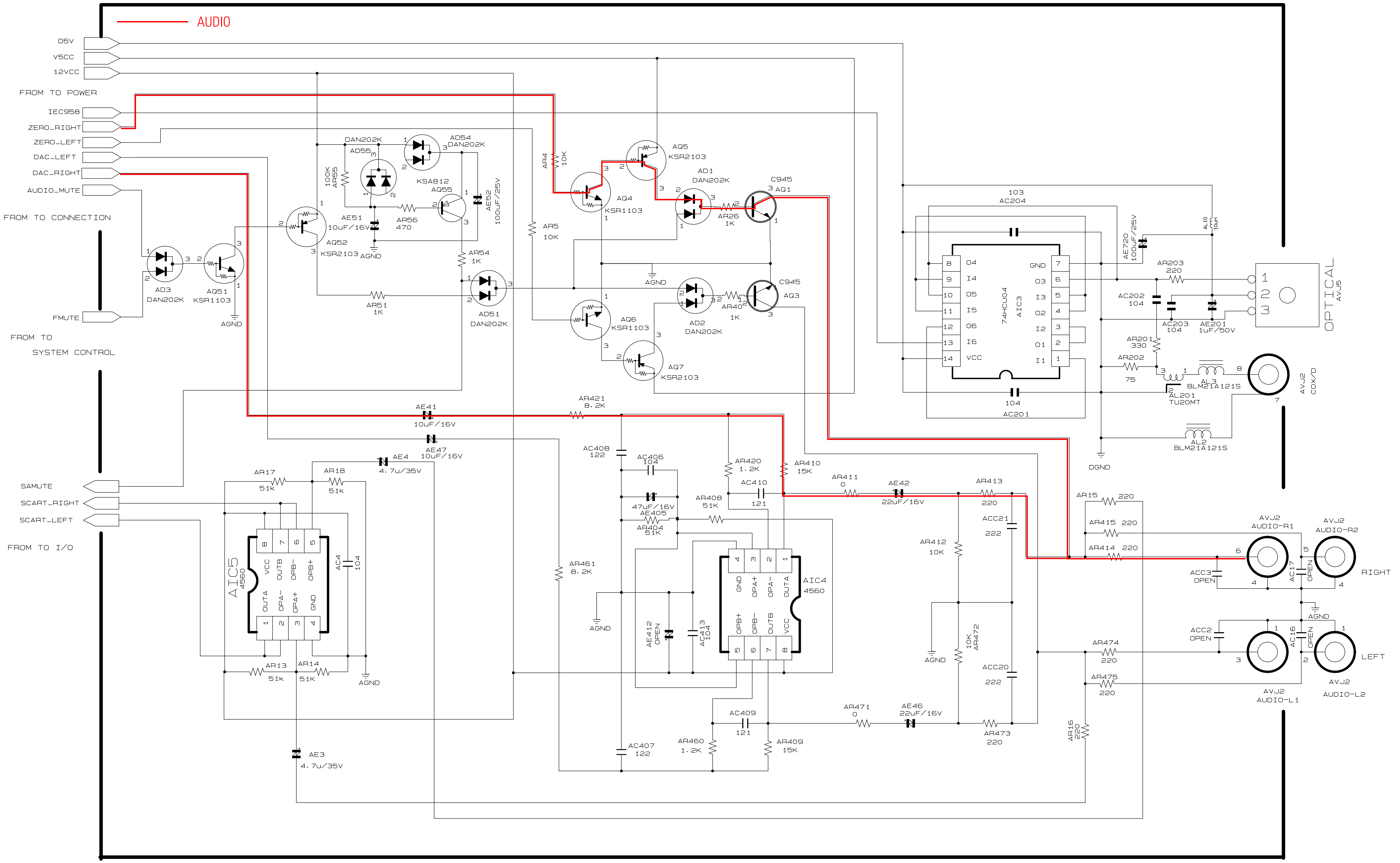
11-12 A2/NICAM (Jack PCB)


AUDIO
SDA
SCL
MRST
FROM TO
SYSTEM CONTROL
SIF_OUT
AUDIO_OUT
FROM TO TM
VID5V
9V
FROM TO POWER
RF_R2
RF_L2
FROM TO
AV INPUT SEL
RF_R
RF_L
FROM TO I/O
TC2 1.5P
TC3 1.5P
TY1 18.432M
TR82 OPEN
TR84 33
TR83 68
DGND
TR1 1K
TL2 4.7uH
TC70 471
TE10 47uF/16V
TC17 104
AGND
TR2 100
TR3 100
TIC1
MSP3417D
MSP3407D(A2 ONLY)
SBO
ADRSEL
TP
NC
XTALO
XTALI
TEST
ANA_IN-
ANA_IN+
AVSUP
AVSS
MONO_IN
VREFTOP
SC1I_R
SC1I_L
SC2I_R
SC2I_L
AGNDC
AHVSS
CAPL_M
AHVSUP
SCL
SDA
DVSUP
DVSS
RESET
VREF2
DACM_R
DACM_L
VREF1
SC01_R
SC01_L
TE20 10uF/16V
TC28 104
TE19 3.3u/50V
TC27 104
TD2 1N4002
TL3 4.7uH
TC72 47pF
TE4 10uF/16V
TC6 152
TC7 471
TC8 221
TR13 100
TC10 104
TR22 560
TR23 560
TR19 OPEN
TR20 OPEN
TC18 103
TC19 103
TR17 100
TR18 100
TE3 10uF/16V
TL1 4.7uH
TC4 471
TC5 152
TE2 10uF/16V
TC71 104

11-13 Power (Jack PCB)


PCN2
GND 12
GND 11
GND 10
K1(21) 9
S4(20) 8
REC_LED(19) 7
RMC(18) 6
AGND(17) 5
STB(16) 4
CLK(15) 3
DOUT(14) 2
DIN(13) 1
AGND 12
ON/OFF2 11
ON/OFF 10
DGND 9
12V_DRV 8
V5CC 7
V5CC_25 6
V3.3 5
AL5.8 4
12VCC 3
33V 2
DGND 1
PCN1
FROM TO SMPS
DGND
AGND 2
12V_FAN 1
AGND
CON6
CN2P
TO FAN
FE4
100uF/16V
FC12
104
AGND
FL1 0
FD9
000
FD2 1N5819
FD3 1N5819
TC81
104
AGND
TE35
100uF/16V
FC6 104
FC7 104
FC8 104
FC9 104
DGND
FR50 OPEN
FD5
1N5408(3A)
D551
0
BR1 1K(1/4W)
D501
1N4002
BR3
3.9K(1/4W)
AGND
BT501
3V
VL2330-1HF
BR2
100(1/4W)
AGND
BATTERY PART(OPTION)
L331 10uH
FD6 000
FL3 100uH
FD7 1N5819
L332
100uH
FE6
10uF/50V
AGND
PQ1
C2328
2
1
3
FE8
10uF/50V
AGND
PR04 180
AGND
FE7
4.7uF/35V
AGND
ZD1
UDZ9.1B
FD8
1N4148
AGND
K1
S4
REC_LED
RMC
STB
CLK
DOUT
DIN
ON/OFF2
ON/OFF
F5V
FF5V
FROM TO
SYSTEM CONTROL
VCC_25
V2.8V
V3.3V
AL5.8V
V33_SRAM
V5CC
12VCC
TO CONNECTION
VID5.8V
33V
TO TM
12VCC
D5V
V5CC
TO AUDIO OUT
VAD5V
12VCC
TO I/O
VID5V
9V
TO A2/NICAM
F5V
VID5V
TO OSD
12VCC
VID5V
TO AV INPUT SEL

11-14 Audio Out (Jack PCB)


AUDIO
D5V
V5CC
12VCC
FROM TO POWER
IEC958
ZERO_RIGHT
ZERO_LEFT
DAC_LEFT
DAC_RIGHT
AUDIO_MUTE
FROM TO CONNECTION
FMUTE
FROM TO
SYSTEM CONTROL
SAMUTE
SCART_RIGHT
SCART_LEFT
FROM TO I/O
DAN202K
AD55
AD54
DAN202K
100K
AR55
KSA812
AQ55
AE52
100uF/25V
AE51
10uF/16V
AR56
470
AQ52
KSR2103
AGND
AR54
1K
AD3
DAN202K
AQ51
KSR1103
AR51
1K
AD51
DAN202K
AR4
10K
AR5
10K
AQ5
KSR2103
AQ4
KSR1103
AD1
DAN202K
AR26
1K
C945
AQ1
C945
AQ3
AR40
1K
AD2
DAN202K
AQ6
KSR1103
AQ7
KSR2103
AR421
8.2K
AE41
10uF/16V
AE47
10uF/16V
AE4
4.7u/35V
AR17
51K
AR18
51K
AIC5
4560
VCC
OUTB
OPB-
OPB+
OUTA
OPA-
OPA+
GND
AC4
104
AR13
51K
AR14
51K
AE3
4.7u/35V
AR461
8.2K
AC408
122
AC406
104
AE405
47uF/16V
AR404
51K
AR408
51K
AR420
1.2K
AC410
121
AR410
15K
AE412
OPEN
AC413
104
AIC4
4560
AC409
121
AC407
122
AR460
1.2K
AR409
15K
AR411
0
AE42
22uF/16V
AR413
220
ACC21
222
AR412
10K
AR472
10K
ACC20
222
AR471
0
AE46
22uF/16V
AR473
220
103
AC204
74HCU04
AIC3
GND
VCC
104
AC201
AE720
100uF/25V
AL10
10uH
AR203
220
AC202
104
AC203
104
AE201
1uF/50V
OPTICAL
AVJ5
AR201
330
AR202
75
AL201
TU20MT
AL3
BLM21A121S
AL2
BLM21A121S
AVJ2
COX/D
DGND
AR15
220
AR415
220
AR414
220
AVJ2
AUDIO-R1
AVJ2
AUDIO-R2
RIGHT
ACC3
OPEN
AC17
OPEN
ACC2
OPEN
AC16
OPEN
AR474
220
AR475
220
AR16
220
AVJ2
AUDIO-L1
AVJ2
AUDIO-L2
LEFT

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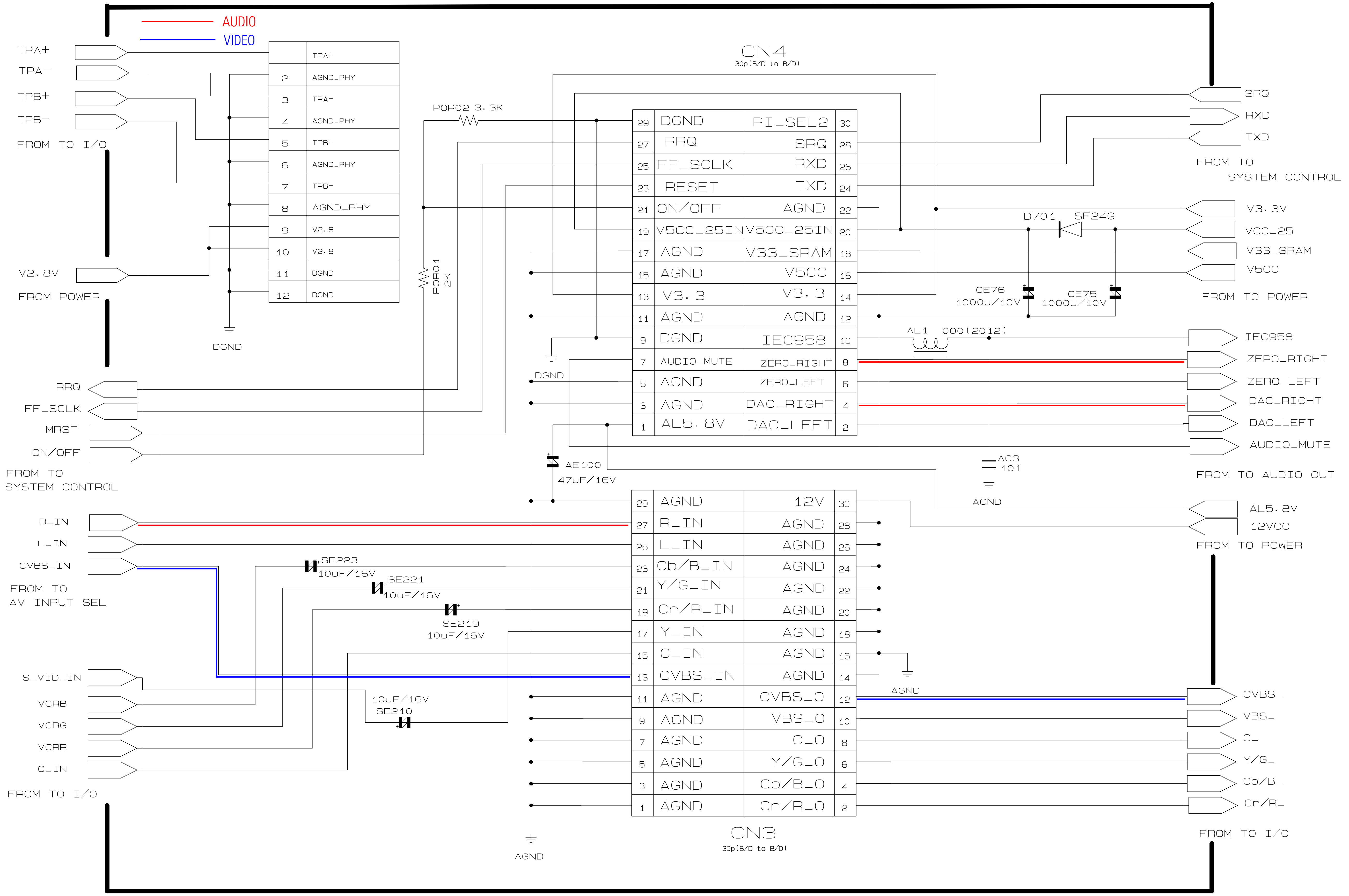
11-15 Jack Connector (Jack PCB)


AUDIO
VIDEO
TPA+
TPA−
TPB+
TPB−
FROM TO I/O
TPA+
AGND_PHY
TPA−
AGND_PHY
TPB+
AGND_PHY
TPB−
AGND_PHY
V2.8
V2.8
DGND
DGND
V2.8V
FROM POWER
DGND
POR02 3.3K
POR01 2K
CN4
30p(B/D to B/D)
DGND
PI_SEL2
RRQ
SRQ
FF_SCLK
RXD
RESET
TXD
ON/OFF
AGND
V5CC_25IN
V5CC_25IN
AGND
V33_SRAM
AGND
V5CC
V3.3
V3.3
AGND
AGND
DGND
IEC958
AUDIO_MUTE
ZERO_RIGHT
AGND
ZERO_LEFT
AGND
DAC_RIGHT
AL5.8V
DAC_LEFT
SRQ
RXD
TXD
FROM TO
SYSTEM CONTROL
D701
SF24G
V3.3V
VCC_25
V33_SRAM
V5CC
CE76
1000u/10V
CE75
1000u/10V
FROM TO POWER
AL1 000(2012)
IEC958
ZERO_RIGHT
ZERO_LEFT
DAC_RIGHT
DAC_LEFT
AUDIO_MUTE
AC3
101
FROM TO AUDIO OUT
AGND
AL5.8V
12VCC
FROM TO POWER
RRQ
FF_SCLK
MRST
ON/OFF
FROM TO
SYSTEM CONTROL
DGND
AE100
47uF/16V
R_IN
L_IN
CVBS_IN
FROM TO
AV INPUT SEL
SE223
10uF/16V
SE221
10uF/16V
SE219
10uF/16V
S_VID_IN
VCRB
VCRG
VCRR
C_IN
FROM TO I/O
10uF/16V
SE210
AGND
AGND
12V
R_IN
AGND
L_IN
AGND
Cb/B_IN
AGND
Y/G_IN
AGND
Cr/R_IN
AGND
Y_IN
AGND
C_IN
AGND
CVBS_IN
AGND
AGND
CVBS_O
AGND
VBS_O
AGND
C_O
AGND
Y/G_O
AGND
Cb/B_O
AGND
Cr/R_O
CN3
30p(B/D to B/D)
AGND
AGND
CVBS_
VBS_
C_
Y/G_
Cb/B_
Cr/R_
FROM TO I/O

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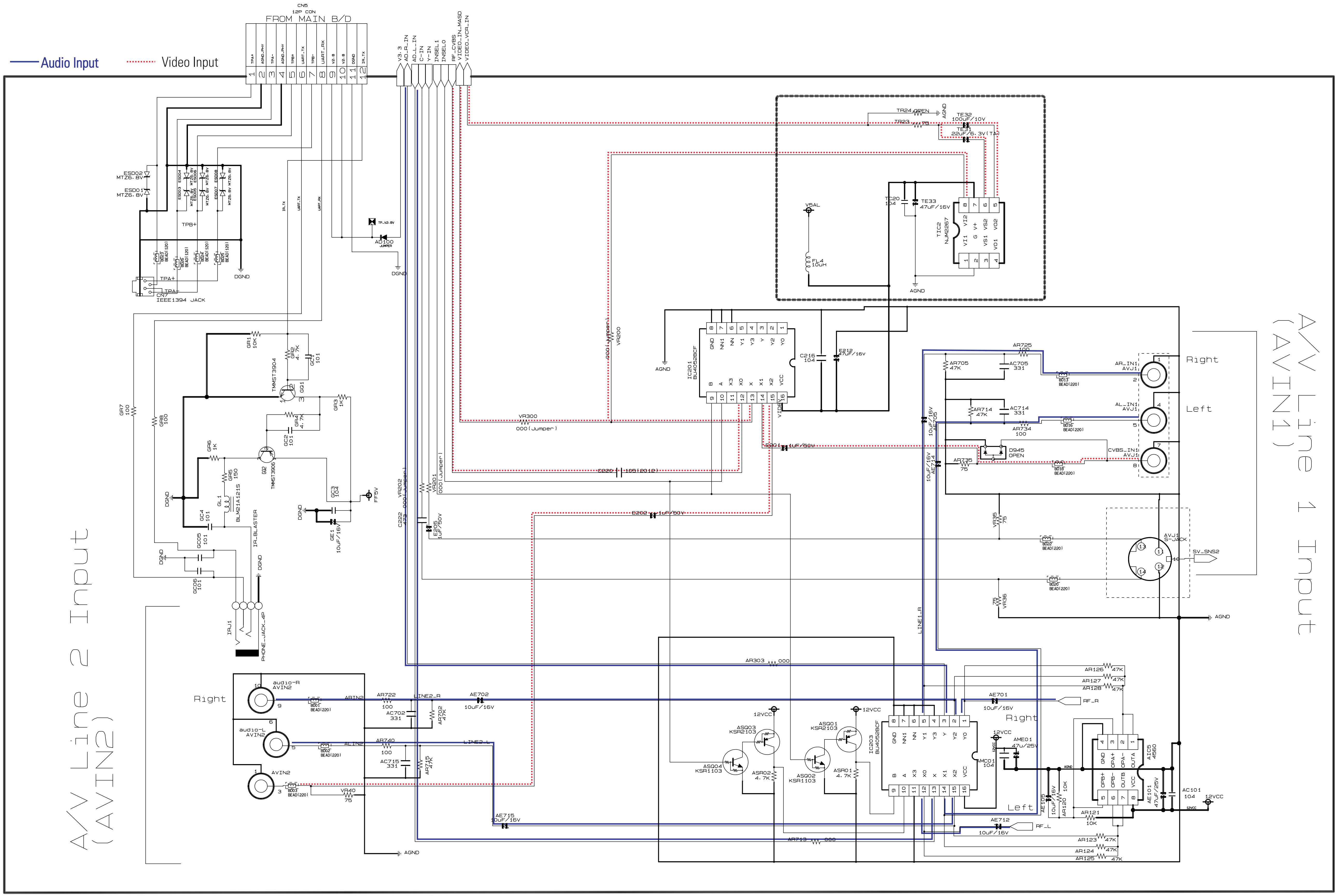
11-16 AV Input Sellection (Jack PCB)


Audio Input
Video Input
CN5
12P CON
FROM MAIN B/D
TPA+
AGND_PHY
TPA-
AGND_PHY
TPB+
UART_TX
TPB-
UART_RX
V2.8
V2.8
DGND
IR_TX
V3.3
AD_R_IN
AD_L_IN
C_IN
Y_IN
INSEL1
INSEL0
RF_CVBS
VIDEO_IN_MASD
VIDEO_VCR_IN
ESD02
MTZ6.8V
ESD01
MTZ6.8V
ESD03
ESD04
ESD05
ESD06
ESD07
ESD08
TPB+
TPA+
TPA-
CN7
IEEE1394 JACK
DGND
TP_V2.8V
AD100
JUMPER
DGND
GR1
10K
GR2
4.7K
GC1
101
TMMST3904
GQ1
GR3
1K
GR4
4.7K
GC2
101
GR7
100
GR8
100
GR6
1K
GR5
150
GQ2
TMMST3906
GC3
104
FF5V
GL1
BLM21A121S
GC4
101
GC05
101
GC06
101
IR_BLASTER
GE1
10uF/16V
DGND
IRJ1
PHONE_JACK_4P
A/V Line 2 Input
(AVIN2)
Right
audio-R
AVIN2
B001
BEAD(220)
ARIN2
AR722
100
LINE2_R
AC702
331
AR702
47K
AE702
10uF/16V
audio-L
AVIN2
B002
BEAD(220)
ALIN2
AR740
100
AC715
331
AR715
47K
LINE2_L
AVIN2
B003
BEAD(220)
VR40
75
AE715
10uF/16V
AGND
VR202
000(Jumper)
C222
472
VR201
000(Jumper)
E205
1uF/50V
VR300
000(Jumper)
VR200
000(Jumper)
C220
105(2012)
E202
1uF/50V
E201
1uF/50V
IC201
BU4052BCF
GND
NN1
NN
Y1
Y3
Y
Y2
Y0
B
A
X3
X0
X
X1
X2
VCC
VIDEO
C216
104
E216
47uF/16V
AGND
TR24 OPEN
TR23 75
AGND
TE32
100uF/10V
TE31
22uF/6.3V(TA)
V5AL
FL4
10uH
TC20
104
TE33
47uF/16V
TIC2
NJM2257
VI2
V+
VS2
VO2
VI1
G
VS1
VO1
AGND
AR725
100
AR705
47K
AC705
331
B013
BEAD(220)
AR_IN1
AVJ1
Right
AL_IN1
AVJ1
Left
AR714
47K
AC714
331
AR734
100
B016
BEAD(220)
AE705
10uF/16V
AE714
10uF/16V
AR735
75
D945
OPEN
CVBS_IN1
AVJ1
B018
BEAD(220)
A/V Line 1 Input
(AVIN1)
VR35
75
B022
BEAD(220)
AVJ1
S-JACK
SV_SNS2
B020
BEAD(220)
VR36
75
AGND
LINE1_R
AR303 000
12VCC
ASQ03
KSR2103
ASQ04
KSR1103
ASR02
4.7K
ASQ01
KSR2103
ASQ02
KSR1103
ASR01
4.7K
IC203
BU4052BCF
AE701
10uF/16V
RF_R
Right
12VCC
AME01
47u/25V
AMC01
104
AR126 47K
AR127 47K
AR128 47K
AIC5
4560
OPA+
OPA-
OUTA
OPB+
OPB-
OUTB
VCC
AE101
47uF/25V
AC101
104
12VCC
AE105
10uF/16V
AR120
10K
AR121
10K
Left
AE712
10uF/16V
RF_L
AR713 000
AR123 47K
AR124 47K
AR125 47K

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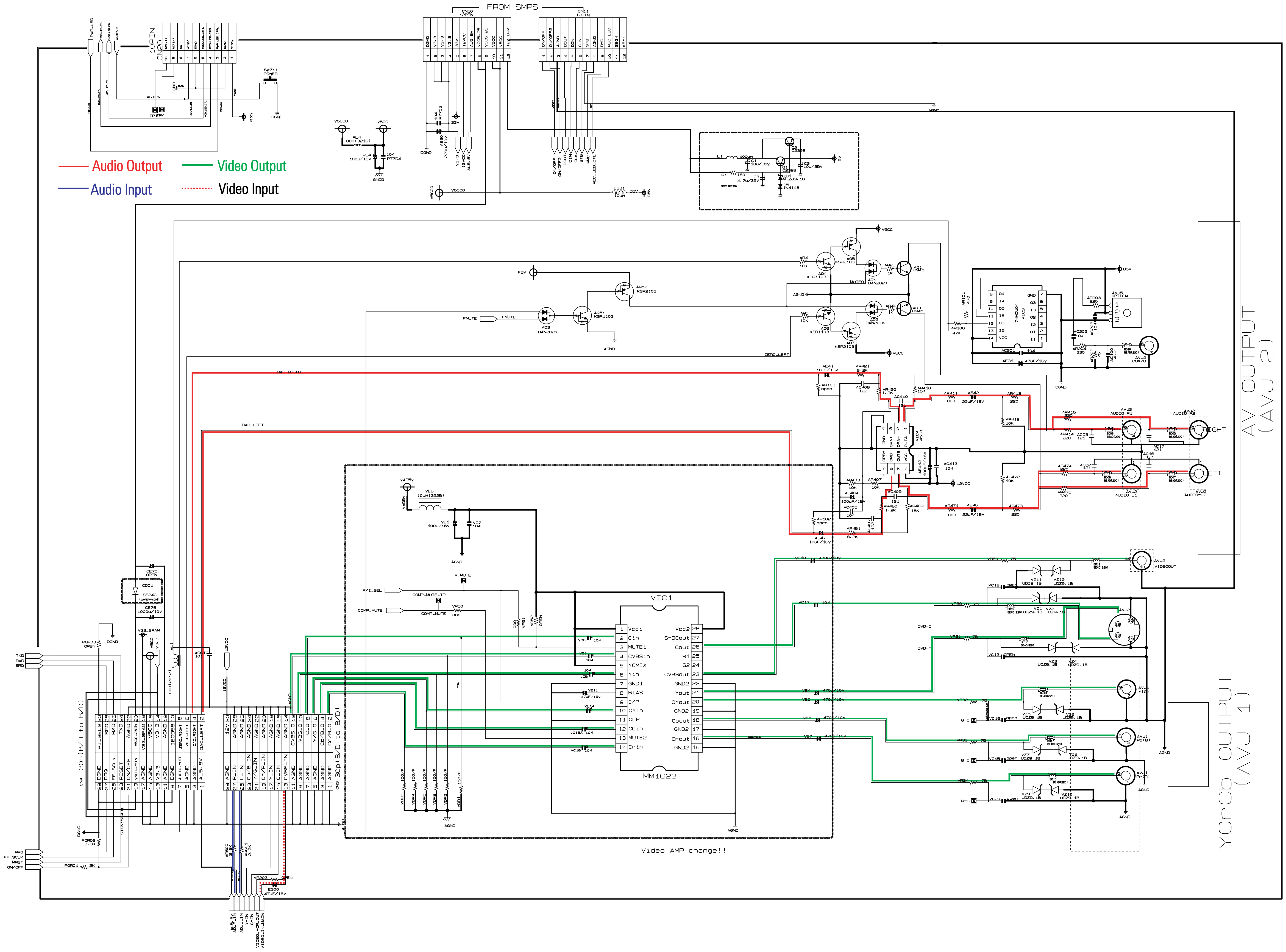
11-17 AV Output Sellection (Jack PCB)


FROM SMPS
CN10 12PIN
CN11 12PIN
10PIN CN20
SW711 POWER
Audio Output
Video Output
Audio Input
Video Input
VIC1
MM1623
Video AMP change!!
AV OUTPUT (AVJ 2)
YCrCb OUTPUT (AVJ 1)
CN4 30p(B/D to B/D)
CN3 30p(B/D to B/D)
RIGHT
LEFT

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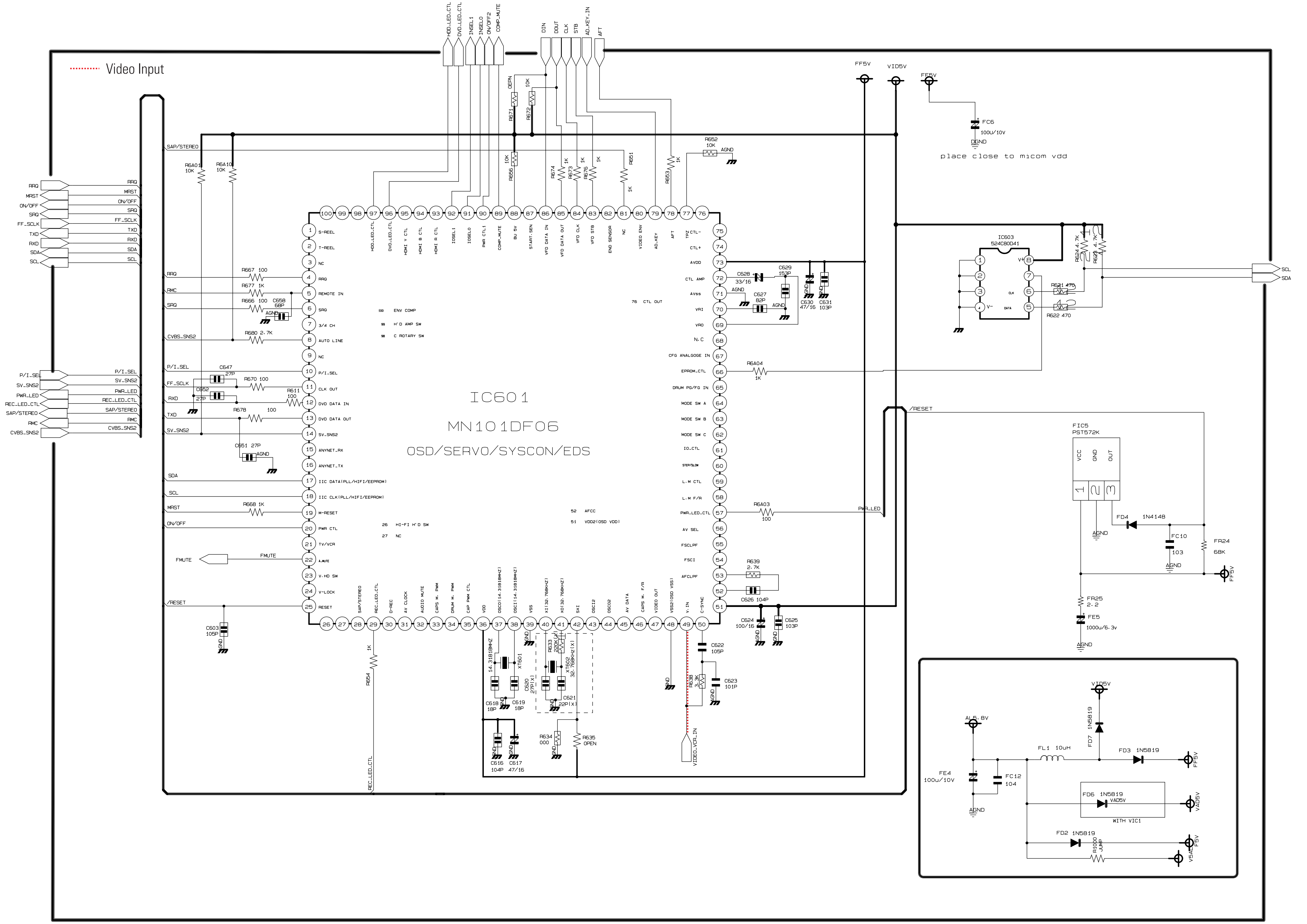
11-18 Micom (Jack PCB)


Video Input
IC601
MN101DF06
OSD/SERVO/SYSCON/EDS
IC603
524C80D41
FIC5
PST572K
VCC
GND
OUT
place close to micom vdd
FF5V
VID5V
FC6
100U/10V
DGND
AGND
HDD_LED_CTL
DVD_LED_CTL
INSEL1
INSEL0
ON/OFF2
COMP_MUTE
DIN
DOUT
CLK
STB
AD_KEY_IN
AFT
SAP/STEREO
RRQ
MRST
ON/OFF
SRQ
FF_SCLK
TXD
RXD
SDA
SCL
RMC
CVBS_SNS2
P/I_SEL
SV_SNS2
PWR_LED
REC_LED_CTL
FMUTE
/RESET
VIDEO_VCR_IN
S-REEL
T-REEL
NC
REMOTE IN
3/4 CH
AUTO LINE
CLK OUT
DVD DATA IN
DVD DATA OUT
ANYNET_RX
ANYNET_TX
IIC DATA(PLL/HIFI/EEPROM)
IIC CLK(PLL/HIFI/EEPROM)
M-RESET
PWR CTL
TV/VCR
V-HD SW
V-LOCK
RESET
CTL-
CTL+
AVDD
CTL AMP
AVSS
VRI
VRO
N.C
CFG ANALGOGE IN
EPROM_CTL
DRUM PG/FG IN
MODE SW A
MODE SW B
MODE SW C
IO_CTL
L.M CTL
L.M F/R
PWR_LED_CTL
AV SEL
FSCLPF
FSCI
AFCLPF
C-SYNC
V-IN
VSS2(OSD VSS)
VIDEO OUT
CAPS M. F/R
AV DATA
OSCI2
OSCO2
SXI
XO(32.768KHZ)
XI(32.768KHZ)
VSS
OSCI(14.318MHZ)
OSCO(14.318MHZ)
VDD
CAP PWM CTL
DRUM M. PWM
CAPS M. PWM
AUDIO MUTE
AV CLOCK
D-REC
HDMI Y CTL
HDMI B CTL
HDMI R CTL
BU 5V
START.SEN
VFD DATA IN
VFD DATA OUT
VFD CLK
VFD STB
END SENSOR
VIDEO ENV
AD_KEY
100 ENV COMP
99 H'D AMP SW
98 C ROTARY SW
76 CTL OUT
52 AFCC
51 VDD2(OSD VDD)
26 HI-FI H'D SW
27 NC
R6A01 10K
R6A10 10K
R667 100
R677 1K
R666 100
C658 68P
R680 2.7K
C647 27P
R670 100
C652 27P
R611 100
R678 100
C651 27P
R668 1K
C603 105P
R654 1K
R671 OEPN
R672 10K
R656 10K
R674 1K
R673 1K
R676 1K
R651 1K
R653 1K
R652 10K
C628 33/16
C629 153P
C627 82P
C630 47/16
C631 103P
R6A04 1K
R6A03 100
R639 2.7K
C626 104P
C624 100/16
C625 103P
C622 105P
C623 101P
R638 3.3K
C618 18P
C619 18P
C620 27P(X)
XT601 14.318MHZ
R633 220K(X)
XT602 32.768KHZ(X)
C621 22P(X)
C616 104P
C617 47/16
R634 000
R635 OPEN
R624 4.7K
R623 4.7K
R621 470
R622 470
CLK
DATA
FD4 1N4148
FC10 103
FR24 68K
FR25 2.2
FE5 1000u/6.3v
AL5.8V
FE4 100u/10V
FC12 104
FL1 10uH
FD7 1N5819
FD3 1N5819
FD6 1N5819
VAD5V
WITH VIC1
FD2 1N5819
R1000 JUMP
V5AD
F5V

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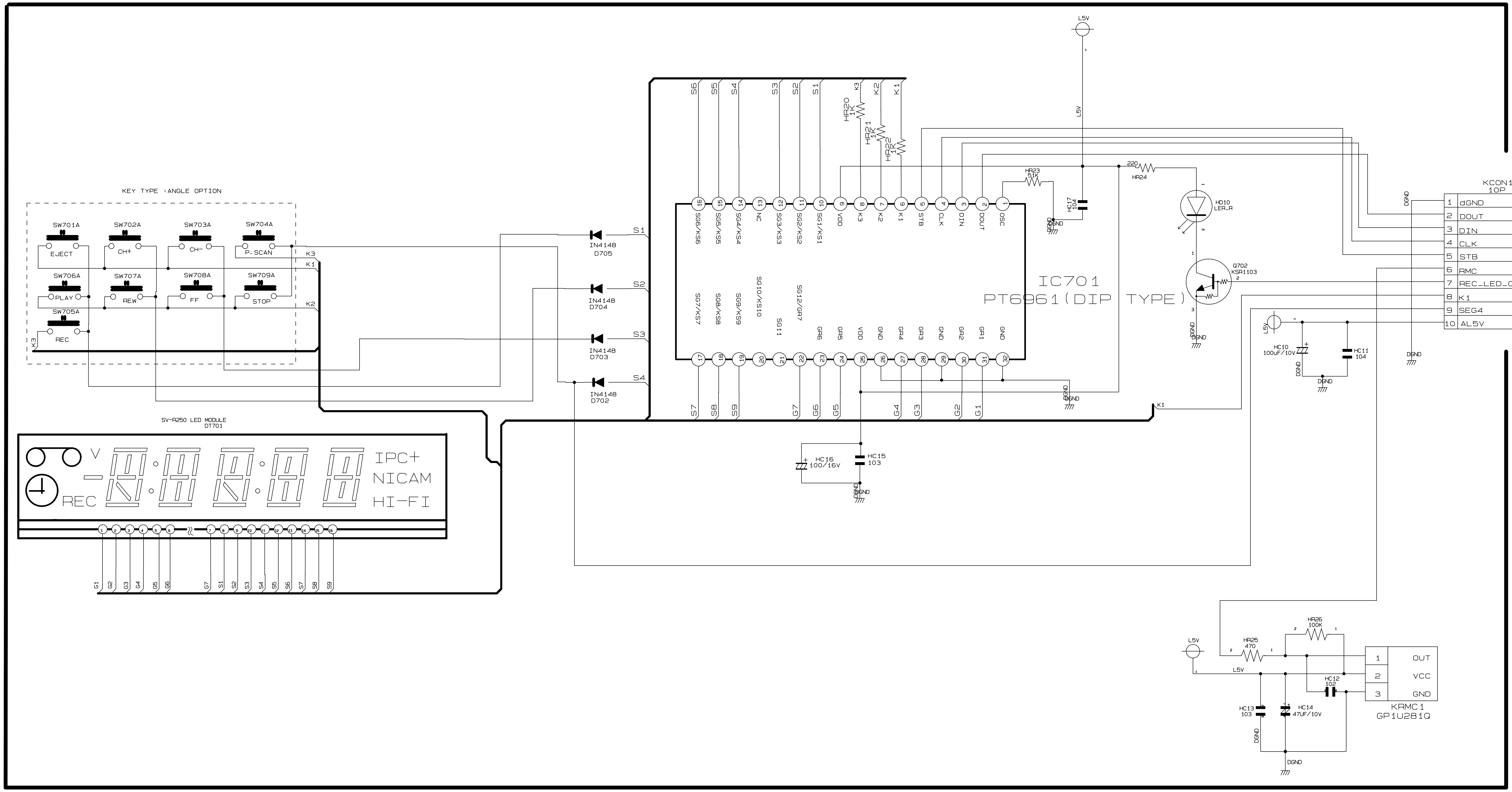
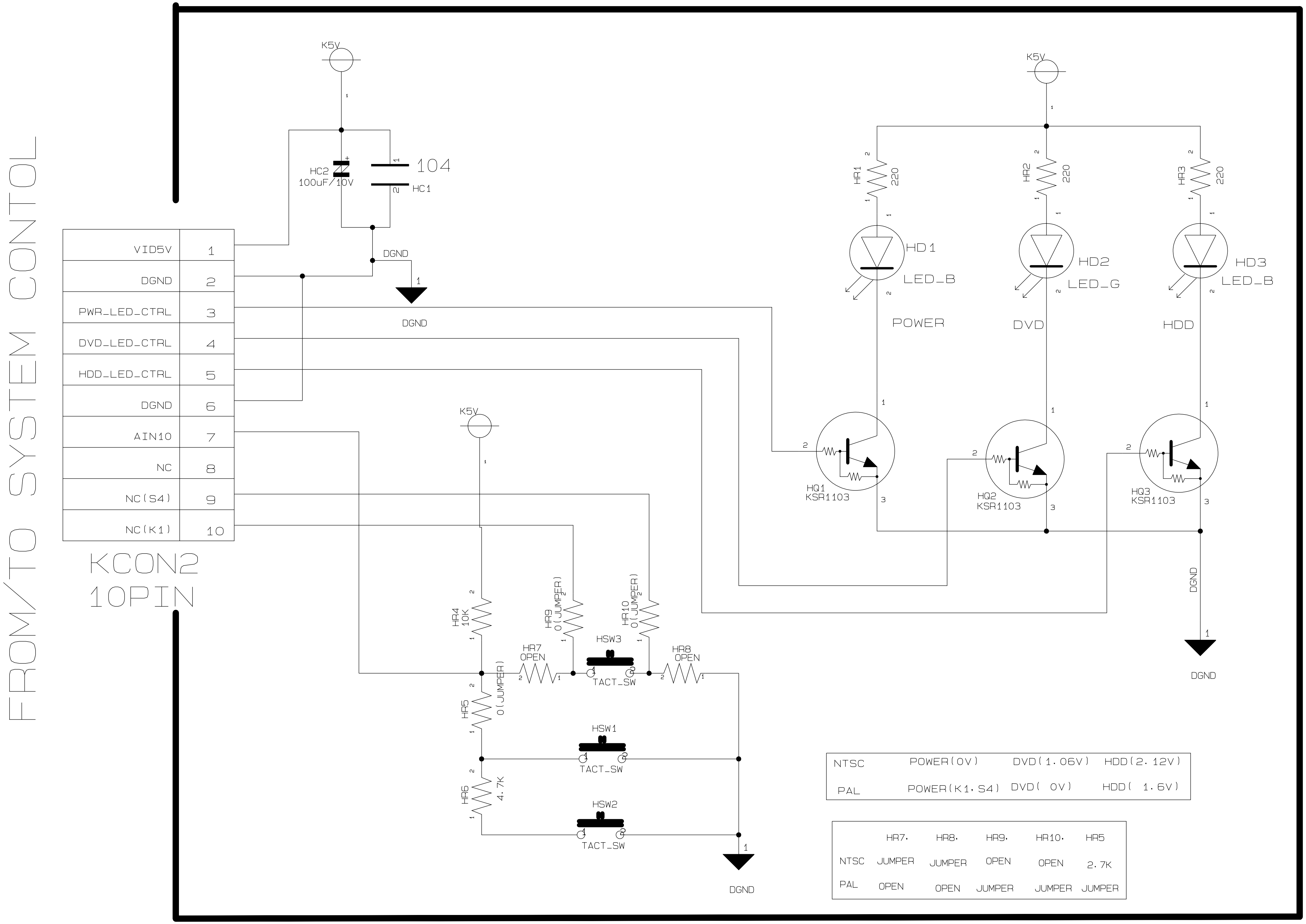
11-19 Right Key (Key PCB)


KEY TYPE :ANGLE OPTION
SW701A
EJECT
SW702A
CH+
SW703A
CH-
SW704A
P. SCAN
SW706A
PLAY
SW707A
REW
SW708A
FF
SW709A
STOP
SW705A
REC
K3
K1
K2
IN4148
D705
IN4148
D704
IN4148
D703
IN4148
D702
S1
S2
S3
S4
S5
S6
S7
S8
S9
SV-R250 LED MODULE
DT701
V
REC
IPC+
NICAM
HI-FI
G1
G2
G3
G4
G5
G6
G7
HR20
1K
HR21
1K
HR22
1K
HR23
51K
HC17
104
L5V
220
HR24
HD10
LER_R
Q702
KSR1103
IC701
PT6961(DIP TYPE)
SG6/KS6
SG5/KS5
SG4/KS4
NC
SG3/KS3
SG2/KS2
SG1/KS1
VDD
K3
K2
K1
STB
CLK
DIN
DOUT
OSC
SG7/KS7
SG8/KS8
SG9/KS9
SG10/KS10
SG11
SG12/GR7
GR6
GR5
VDD
GND
GR4
GR3
GND
GR2
GR1
GND
HC16
100/16V
HC15
103
DGND
HC10
100uF/10V
HC11
104
KCON1
10P
1 dGND
2 DOUT
3 DIN
4 CLK
5 STB
6 RMC
7 REC_LED_CTRL
8 K1
9 SEG4
10 AL5V
FROM/TO SMPS
HR25
470
HR26
100K
HC12
102
HC13
103
HC14
47UF/10V
1 OUT
2 VCC
3 GND
KRMC1
GP1U281Q

11-20 Left Key (Key PCB)


FROM/TO SYSTEM CONTOL
KCON2
10PIN
VID5V 1
DGND 2
PWR_LED_CTRL 3
DVD_LED_CTRL 4
HDD_LED_CTRL 5
DGND 6
AIN10 7
NC 8
NC(S4) 9
NC(K1) 10
K5V
HC2
100uF/10V
104
HC1
DGND
HR1 220
HR2 220
HR3 220
HD1 LED_B
HD2 LED_G
HD3 LED_B
POWER
DVD
HDD
HQ1 KSR1103
HQ2 KSR1103
HQ3 KSR1103
HR4 10K
HR9 0(JUMPER)
HR10 0(JUMPER)
HR7 OPEN
HSW3
HR8 OPEN
TACT_SW
HR5 0(JUMPER)
HSW1
HR6 4.7K
HSW2

NTSC	POWER(0V)	DVD(1.06V)	HDD(2.12V)
PAL	POWER(K1,S4)	DVD(0V)	HDD(1.6V)

	HR7,	HR8,	HR9,	HR10,	HR5
NTSC	JUMPER	JUMPER	OPEN	OPEN	2.7K
PAL	OPEN	OPEN	JUMPER	JUMPER	JUMPER

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MEMO

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11 Schematic Diagrams

11-1 S.M.P.S. (SMPS PCB) - 11-2

11-2 Main Connector (DVD PCB) - 11-3

11-3 DDR (DVD PCB) - 11-4

11-4 IEEE1394 (DVD PCB) - 11-5

11-5 A/V Codec (DVD PCB)- 11-6

11-6 Audio In/Out (DVD PCB) - 11-7

11-7 Video Decoder (DVD PCB)- 11-8

11-8 I/O (Jack PCB)- 11-9

11-9 OSD (Jack PCB)- 11-10

11-10 System Control (Jack PCB) - 11-11

11-11 TM (Jack PCB)- 11-12

11-12 A2/NICAM (Jack PCB) - 11-13

11-13 Power (Jack PCB) - 11-14

11-14 Audio Out (Jack PCB) - 11-15

11-15 Jack Connector (Jack PCB)- 11-16

11-16 AV Input Sellection (Jack PCB) - 11-17

11-17 AV Output Sellection (Jack PCB) - 11-18

11-18 Micom (Jack PCB) - 11-19

11-19 Right Key (Key PCB) - 11-20

11-20 Left Key (Key PCB) - 11-21

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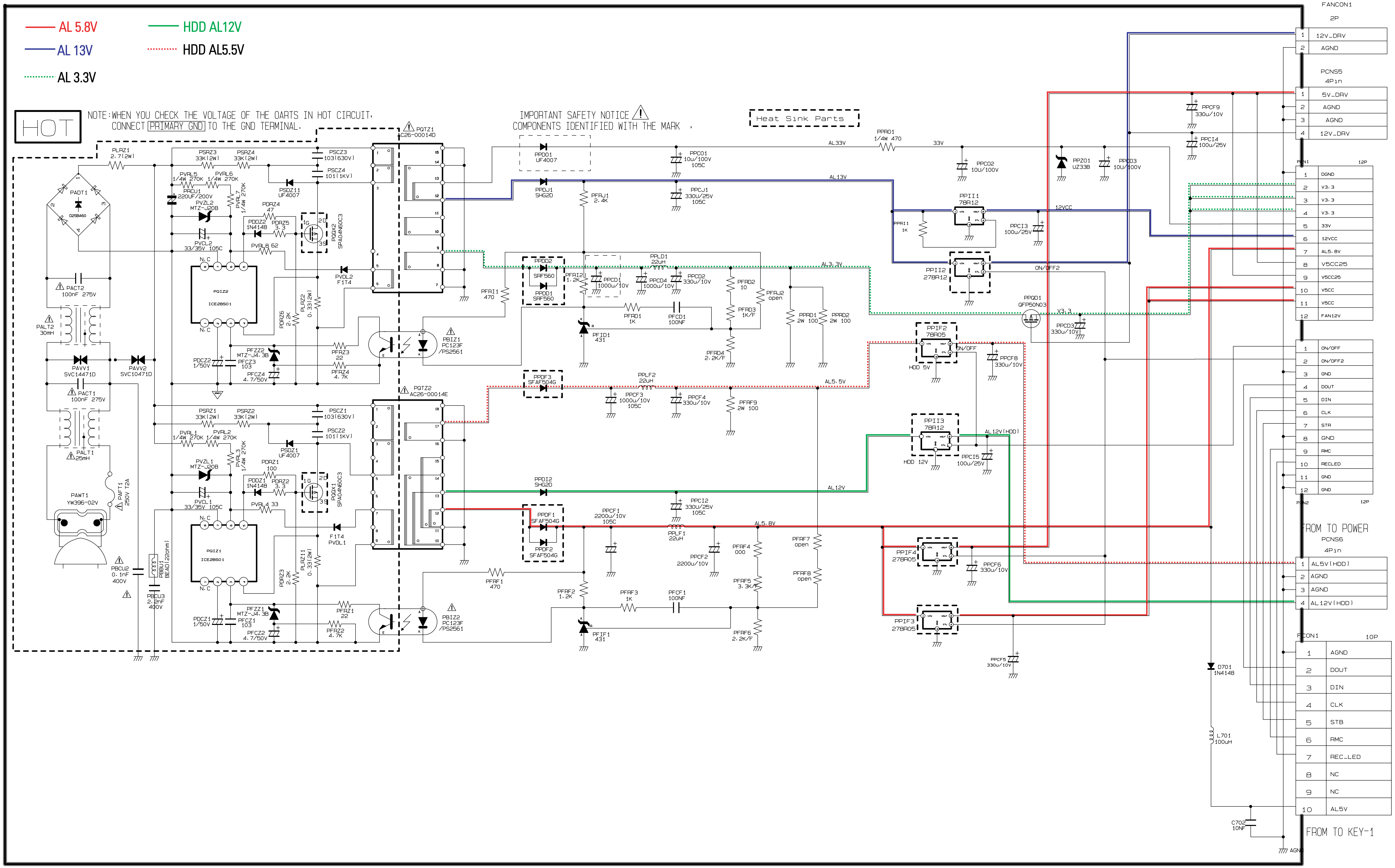
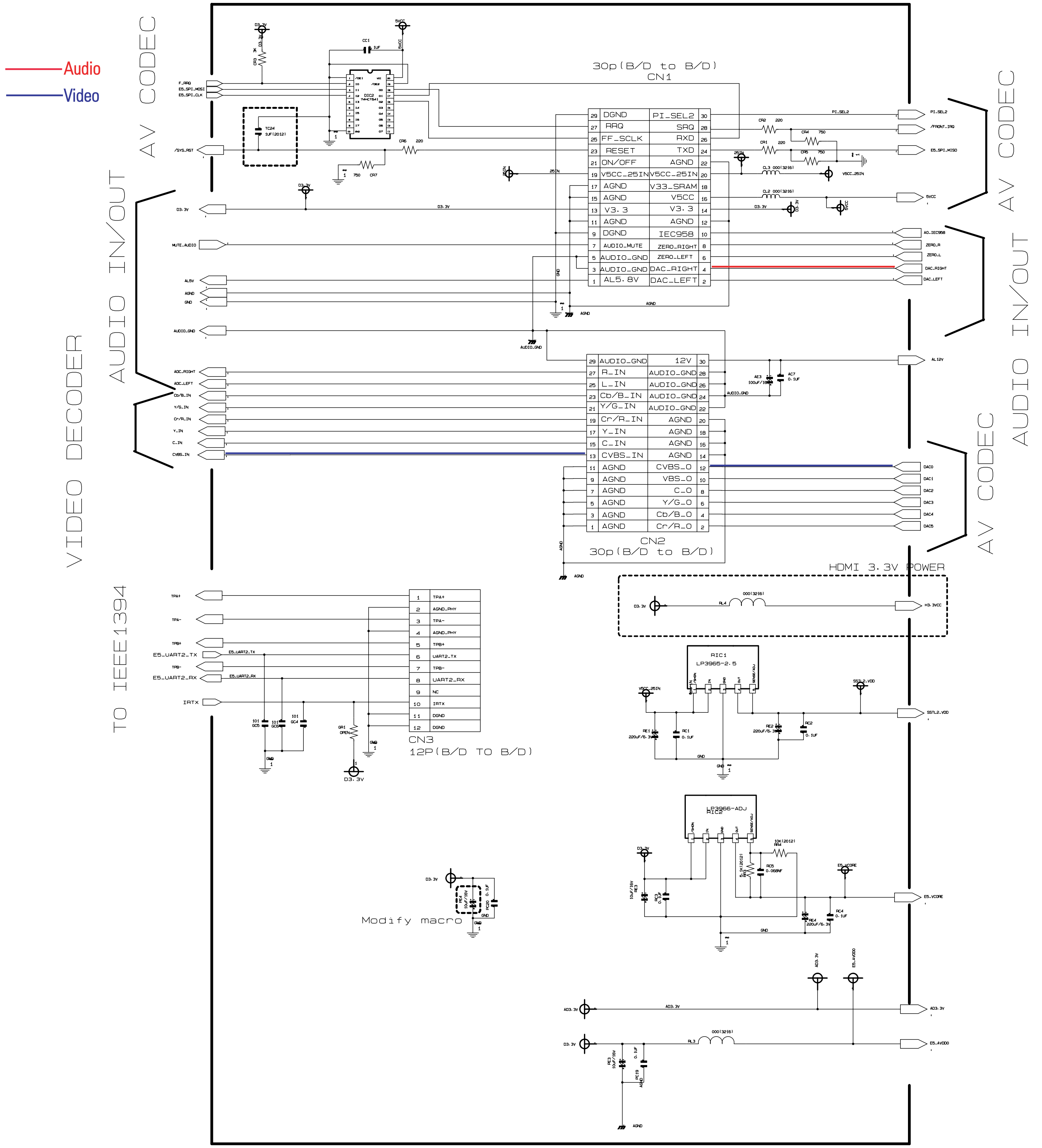
11-1 S.M.P.S. (SMPS PCB)


AL 5.8V
AL 13V
AL 3.3V
HDD AL12V
HDD AL5.5V
HOT
NOTE:WHEN YOU CHECK THE VOLTAGE OF THE OARTS IN HOT CIRCUIT,
CONNECT PRIMARY GND TO THE GND TERMINAL.
IMPORTANT SAFETY NOTICE
COMPONENTS IDENTIFIED WITH THE MARK
Heat Sink Parts
PLRZ1 2.7(2W)
PADT1 D25BM60
PACT2 100nF 275V
PALT2 30mH
PAVV1 SVC14471D
PAVV2 SVC10471D
PACT1 100nF 275V
PALT1 25mH
PAWT1 YW396-02V
PAFT1 250V T2A
PBCU2 0.1nF 400V
PBCU3 2.2nF 400V
PBED1 BEAD(22ohm)
PSRZ3 33K(2W)
PSRZ4 33K(2W)
PSCZ3 103(630V)
PSCZ4 101(1KV)
PVRL5 1/4W 270K
PVRL6 1/4W 270K
PVRL7 1/4W 270K
PRCU1 220UF/200V
PVZL2 MTZ-J20B
PSDZ11 UF4007
PDRZ4 47
PDDZ2 1N4148
PDRZ5 3.3
PQDX2 SPA04N60C3
PVCL2 33/35V 105C
PVRL6 62
PQIZ2 ICE2BS01
N.C
PDRZ6 2.2K
PLRZ2 0.33(2W)
PVDL2 F1T4
PDCZ2 1/50V
PFZZ2 MTZ-J4.3B
PFCZ3 103
PFCZ4 4.7/50V
PFRZ3 22
PFRZ4 4.7K
PBIZ1 PC123F /PS2561
PQTZ1 AC26-00014D
PQTZ2 AC26-00014E
PSRZ1 33K(2W)
PSRZ2 33K(2W)
PSCZ1 103(630V)
PSCZ2 101(1KV)
PVRL1 1/4W 270K
PVRL2 1/4W 270K
PVRL3 1/4W 270K
PSDZ1 UF4007
PVZL1 MTZ-J20B
PDRZ1 100
PDDZ1 1N4148
PDRZ2 3.3
PQDX1 SPA04N60C3
PVCL1 33/35V 105C
PVRL4 33
PQIZ1 ICE2BS01
PDRZ3 2.2K
PLRZ11 0.33(2W)
F1T4 PVDL1
PDCZ1 1/50V
PFZZ1 MTZ-J4.3B
PFCZ1 103
PFCZ2 4.7/50V
PFRZ1 22
PFRZ2 4.7K
PBIZ2 PC123F /PS2561
PPDO1 UF4007
PPDJ1 SH20
PFRJ1 2.4K
PPCO1 10u/100V 105C
PPCJ1 330u/25V 105C
AL33V
PPRO1 1/4W 470
33V
PPCO2 10u/100V
PPZO1 UZ33B
PPCO3 10u/100V
AL13V
PPII1 78R12
PPRI1 1K
PPCI3 100u/25V
12VCC
PPDD2 SRF560
PPDD1 SRF560
PFRI2 1.2K
PPLD1 22uH
PPCD1 1000u/10V
PPCD4 1000u/10V
PPCD2 330u/10V
PFRD2 10
PFRJ2 open
AL3.3V
PPII2 78R12
ON/OFF2
PFRI1 470
PFRD1 1K
PFCD1 100NF
PFRD3 1K/F
PPRD1 2W 100
PPRD2 2W 100
PPQD1 QFP50N03
V3.3
PPCD3 330u/10V
PFID1 431
PFRD4 2.2K/F
PPIF2 78R05
ON/OFF
HDD 5V
PPCF8 330u/10V
PPDF3 SFAF504G
PPLF2 22uH
PPCF3 1000u/10V 105C
PPCF4 330u/10V
PFRF9 2W 100
AL5.5V
PPII3 78R12
AL12V(HDD)
HDD 12V
PPCI5 100u/25V
PPDI2 SH20
AL12V
PPCI2 330u/25V 105C
PPDF1 SFAF504G
PPDF2 SFAF504G
PPCF1 2200u/10V 105C
PPLF1 22uH
AL5.8V
PPCF2 2200u/10V
PFRF4 000
PFRF7 open
PFRF8 open
PFRF5 3.3K/F
PPIF4 278R05
PPCF6 330u/10V
PFRF1 470
PFRF2 1.2K
PFRF3 1K
PFCF1 100NF
PFIF1 431
PFRF6 2.2K/F
PPIF3 278R05
PPCF5 330u/10V
PPCF9 330u/10V
PPCI4 100u/25V
FANCON1 2P
1 12V_DRV
2 AGND
PCNS5 4Pin
1 5V_DRV
2 AGND
3 AGND
4 12V_DRV
PCN1 12P
1 DGND
2 V3.3
3 V3.3
4 V3.3
5 33V
6 12VCC
7 AL5.8V
8 V5CC25
9 V5CC25
10 V5CC
11 V5CC
12 FAN12V
1 ON/OFF
2 ON/OFF2
3 GND
4 DOUT
5 DIN
6 CLK
7 STB
8 GND
9 RMC
10 RECLED
11 GND
12 GND
PCN2 12P
FROM TO POWER
PCNS6 4Pin
1 AL5V(HDD)
2 AGND
3 AGND
4 AL12V(HDD)
FCON1 10P
1 AGND
2 DOUT
3 DIN
4 CLK
5 STB
6 RMC
7 REC_LED
8 NC
9 NC
10 AL5V
D701 1N4148
L701 100uH
C702 10NF
AGND
FROM TO KEY-1

11-2 Main Connector (DVD PCB)


Audio
Video
AV CODEC
AUDIO IN/OUT
VIDEO DECODER
TO IEEE1394
30p(B/D to B/D)
CN1
29 DGND
27 RRQ
25 FF_SCLK
23 RESET
21 ON/OFF
19 V5CC_25IN
17 AGND
15 AGND
13 V3.3
11 AGND
9 DGND
7 AUDIO_MUTE
5 AUDIO_GND
3 AUDIO_GND
1 AL5.8V
PI_SEL2 30
SRQ 28
RXD 26
TXD 24
AGND 22
V5CC_25IN 20
V33_SRAM 18
V5CC 16
V3.3 14
AGND 12
IEC958 10
ZERO_RIGHT 8
ZERO_LEFT 6
DAC_RIGHT 4
DAC_LEFT 2
29 AUDIO_GND
27 R_IN
25 L_IN
23 Cb/B_IN
21 Y/G_IN
19 Cr/R_IN
17 Y_IN
15 C_IN
13 CVBS_IN
11 AGND
9 AGND
7 AGND
5 AGND
3 AGND
1 AGND
12V 30
AUDIO_GND 28
AUDIO_GND 26
AUDIO_GND 24
AUDIO_GND 22
AGND 20
AGND 18
AGND 16
AGND 14
CVBS_O 12
VBS_O 10
C_O 8
Y/G_O 6
Cb/B_O 4
Cr/R_O 2
CN2
30p(B/D to B/D)
HDMI 3.3V POWER
1 TPA+
2 AGND_PHY
3 TPA-
4 AGND_PHY
5 TPB+
6 UART2_TX
7 TPB-
8 UART2_RX
9 NC
10 IRTX
11 DGND
12 DGND
CN3
12P(B/D TO B/D)
E5_UART2_TX
E5_UART2_RX
IRTX
RIC1
LP3965-2.5
RIC2
LP3966-ADJ
Modify macro
D3.3V
AD3.3V
E5_AVDD
E5_VCORE
SSTL2_VDD
H3.3VCC
AL12V
DAC0
DAC1
DAC2
DAC3
DAC4
DAC5
PI_SEL2
/FRONT_IRQ
E5_SPI_MISO
5VCC
AO_IEC958
ZERO_R
ZERO_L
DAC_RIGHT
DAC_LEFT
F_RRQ
E5_SPI_MOSI
E5_SPI_CLK
/SYS_RST
MUTE_AUDIO
AL5V
AGND
GND
AUDIO_GND
ADC_RIGHT
ADC_LEFT
Cb/B_IN
Y/G_IN
Cr/R_IN
Y_IN
C_IN
CVBS_IN
TPA+
TPA-
TPB+
TPB-

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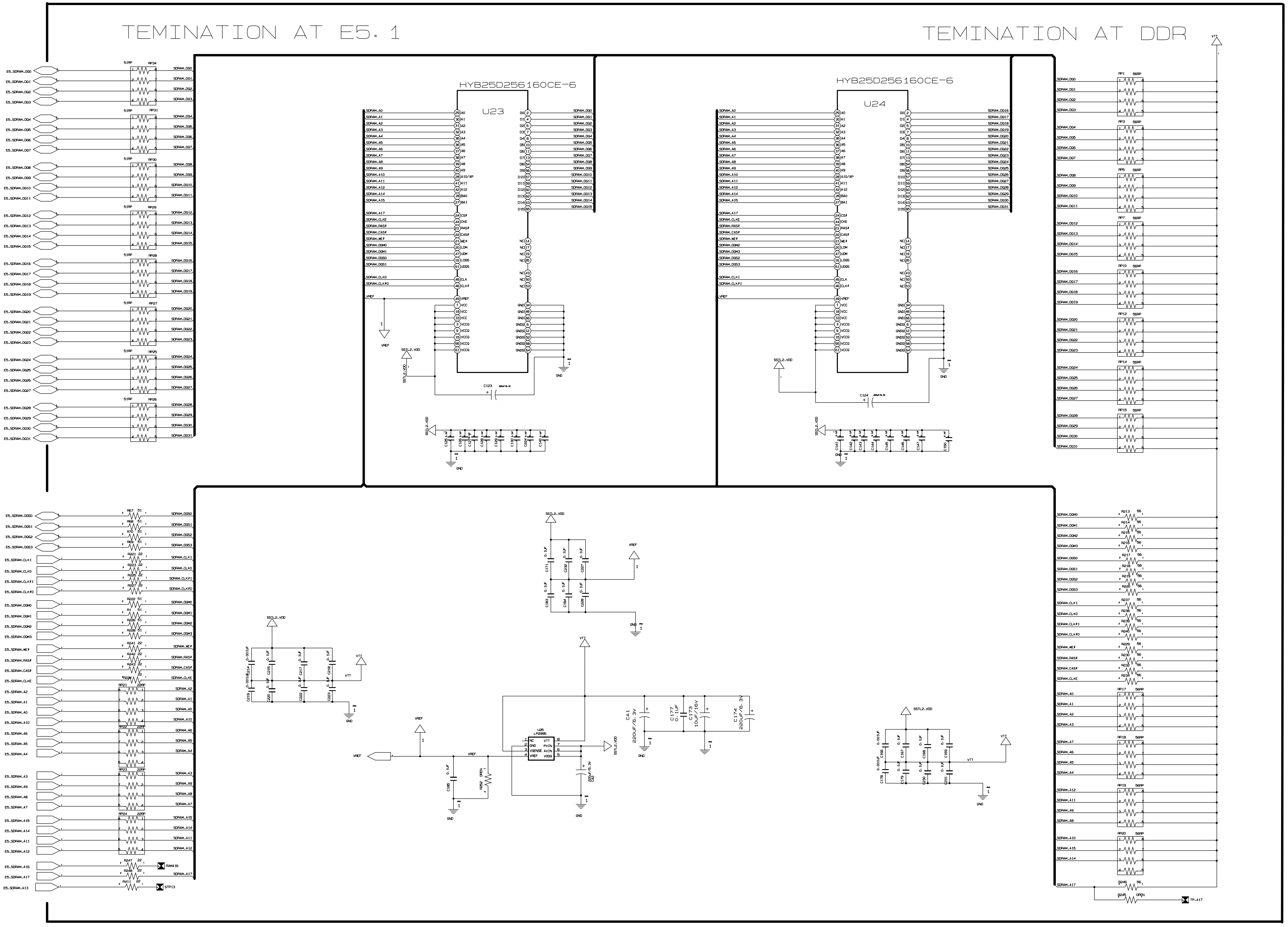
11-3 DDR (DVD PCB)


TEMINATION AT E5.1
TEMINATION AT DDR
FROM TO AV CODEC
HYB25D256160CE-6
U23
HYB25D256160CE-6
U24
U25
LP2996
SSTL2_VDD
VREF
VTT
GND
C123
C124
CA1
220uF/6.3V
C177
0.1uF
C173
10uF/16V
C174
220uF/6.3V
RP34
RP31
RP30
RP29
RP28
RP27
RP25
RP26
RP1
RP3
RP5
RP7
RP10
RP12
RP14
RP15
RP17
RP18
RP19
RP20
RP21
RP22
RP23
RP24
RA4#16
STP13
TP_A17

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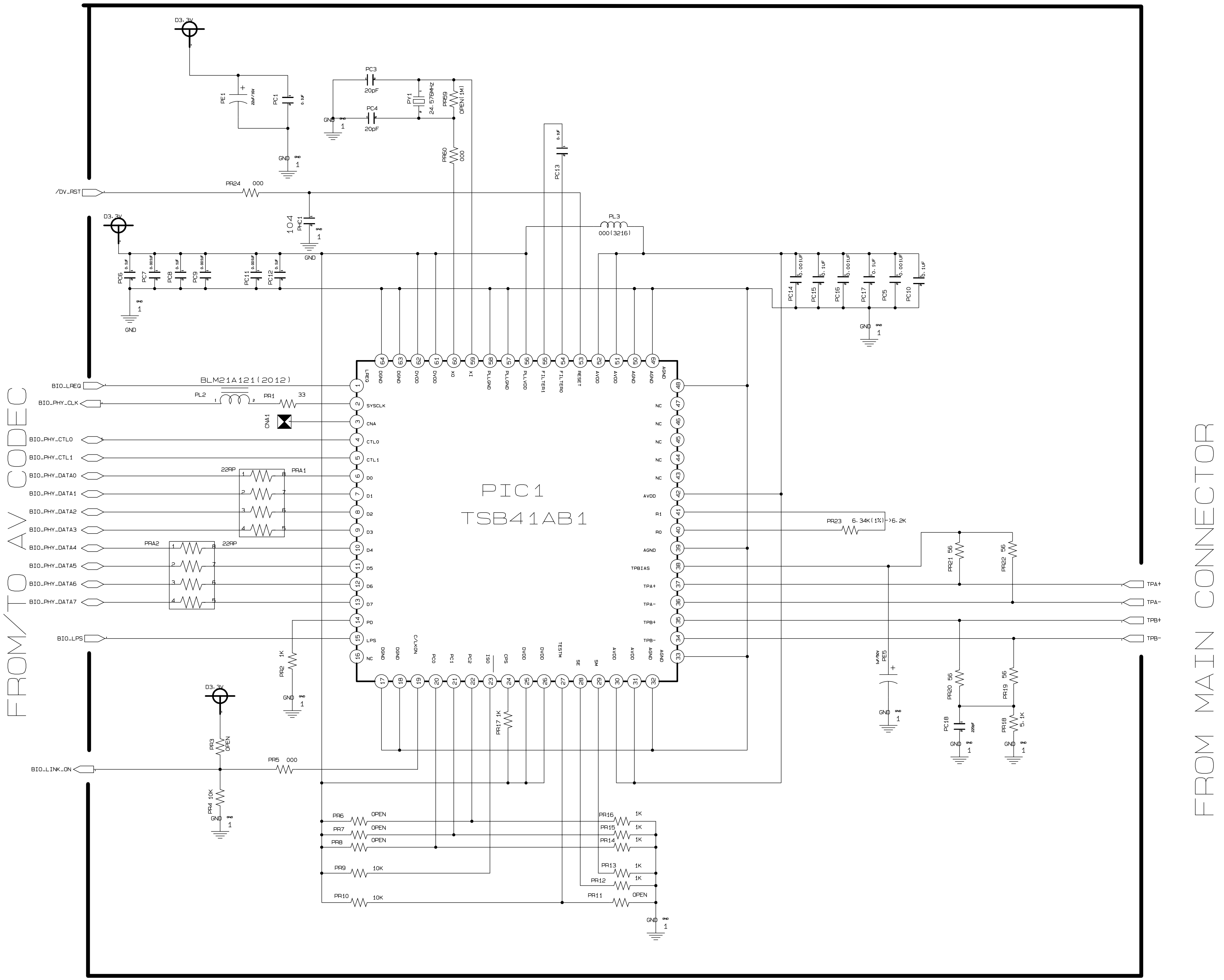
11-4 IEEE1394 (DVD PCB)


FROM/TO AV CODEC
FROM MAIN CONNECTOR
PIC1
TSB41AB1
D3.3V
PE1
PC1
PC3
20pF
PC4
20pF
PY1
24.576MHz
PR59
OPEN(M)
PR60
000
PC13
/DV_RST
PR24 000
PHC1
104
PL3
000(3216)
PC6
PC7
PC8
PC9
PC11
PC12
PC14
PC15
PC16
PC17
PC5
PC10
GND
BIO_LREQ
BIO_PHY_CLK
BLM21A121(2012)
PL2
PR1 33
CNA1
BIO_PHY_CTL0
BIO_PHY_CTL1
BIO_PHY_DATA0
BIO_PHY_DATA1
BIO_PHY_DATA2
BIO_PHY_DATA3
BIO_PHY_DATA4
BIO_PHY_DATA5
BIO_PHY_DATA6
BIO_PHY_DATA7
BIO_LPS
PRA1
22RP
PRA2
22RP
PR2 1K
PR3 OPEN
BIO_LINK_ON
PR5 000
PR4 10K
PR17 1K
PR6 OPEN
PR7 OPEN
PR8 OPEN
PR9 10K
PR10 10K
PR16 1K
PR15 1K
PR14 1K
PR13 1K
PR12 1K
PR11 OPEN
PR23 6.34K(1%)->6.2K
PR21 56
PR22 56
PR20 56
PR19 56
PR18 5.1K
PC18
PE5
TPA+
TPA-
TPB+
TPB-
LREQ
SYSCLK
CNA
CTL0
CTL1
D0
D1
D2
D3
D4
D5
D6
D7
PD
LPS
NC
DGND
DVDD
XO
XI
PLLGND
PLLVDD
FILTER1
FILTER0
RESET
AVDD
AGND
R1
R0
TPBIAS
C/LKON
PC0
PC1
PC2
ISO
CPS
TESTM
SE
SM

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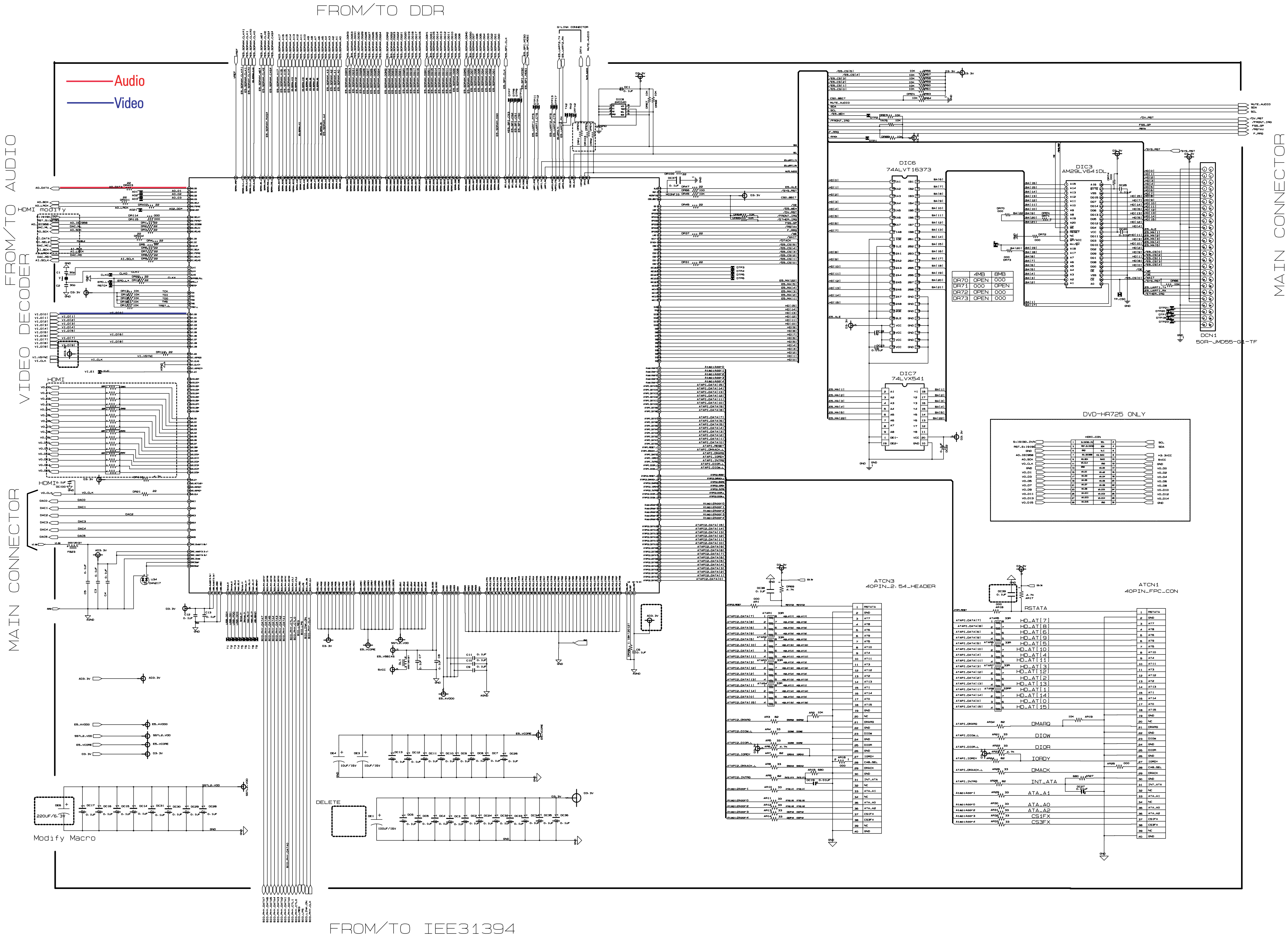
11-5 A/V Codec (DVD PCB)


FROM/TO DDR
Audio
Video
FROM/TO AUDIO
VIDEO DECODER
HDMI modify
HDMI
MAIN CONNECTOR
DIC6
74ALVT16373
DIC3
AM29LV641DL
DIC7
74LVX541
DCN1
50R-JMD55-G1-TF
MAIN CONNECTOR
4MB
8MB
DR70 OPEN 000
DR71 000 OPEN
DR72 OPEN 000
DR73 OPEN 000
DVD-HR725 ONLY
ATCN3
40PIN_2.54_HEADER
ATCN1
40PIN_FPC_CON
DELETE
220UF/6.3V
Modify Macro
FROM/TO IEE31394

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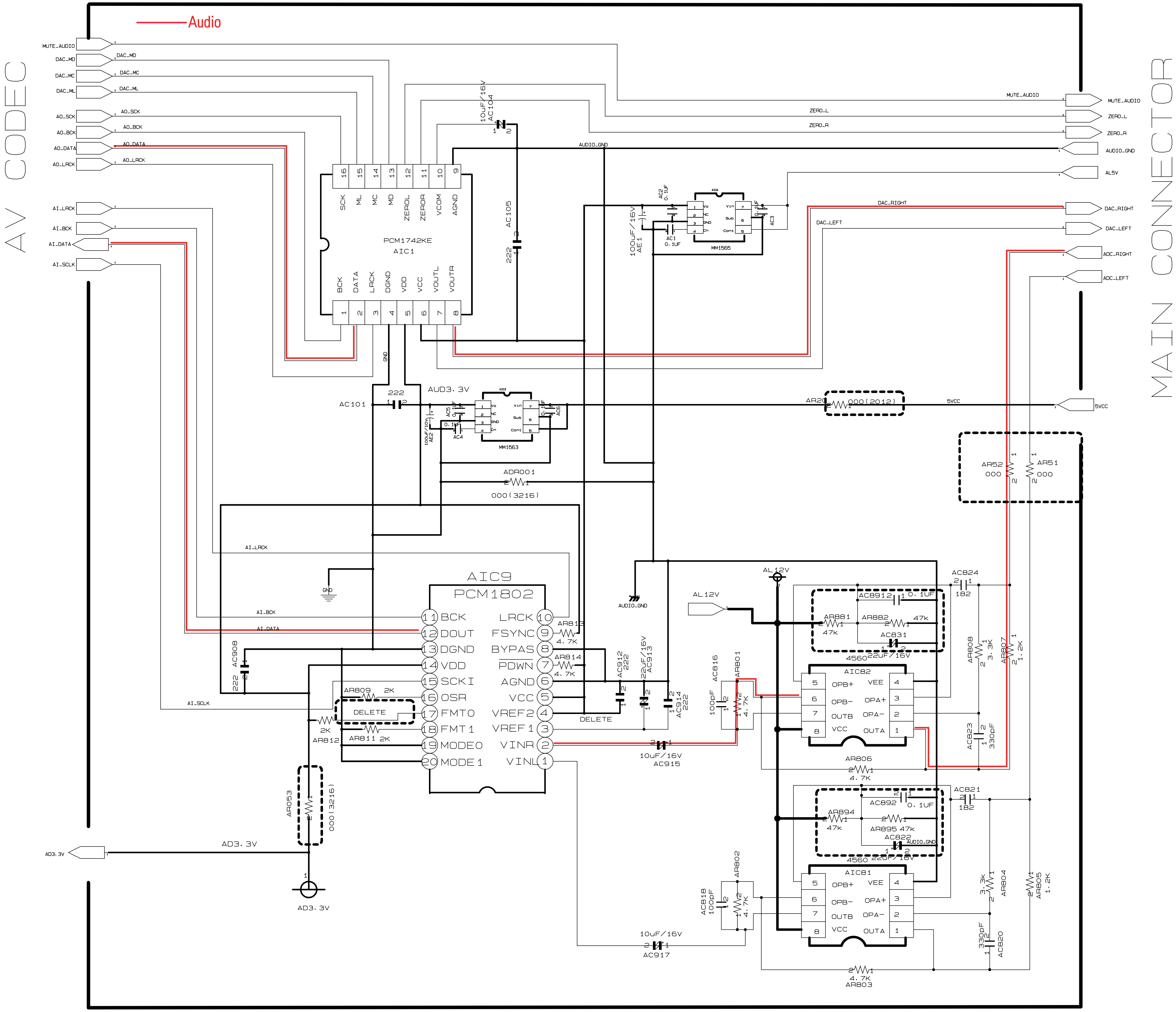
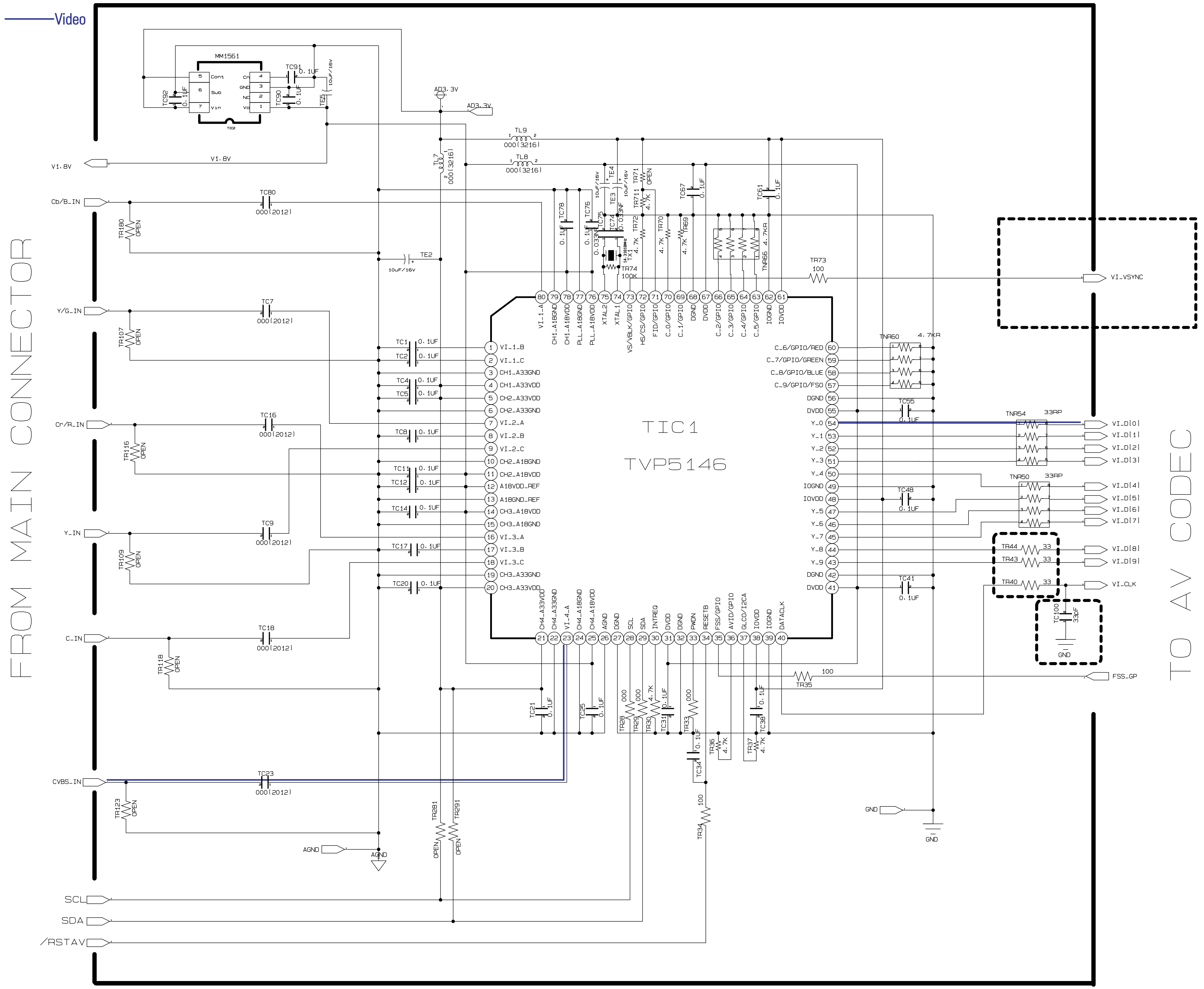
11-6 Audio In/Out (DVD PCB)


Audio
AV CODEC
MAIN CONNECTOR
MUTE_AUDIO
DAC_MD
DAC_MC
DAC_ML
AO_SCK
AO_BCK
AO_DATA
AO_LRCK
AI_LRCK
AI_BCK
AI_DATA
AI_SCLK
ZERO_L
ZERO_R
AUDIO_GND
AL5V
DAC_RIGHT
DAC_LEFT
ADC_RIGHT
ADC_LEFT
5VCC
PCM1742KE
AIC1
SCK
ML
MC
MD
ZEROL
ZEROR
VCOM
AGND
BCK
DATA
LRCK
DGND
VDD
VCC
VOUTL
VOUTR
10uF/16V
AC104
AC105
222
100uF/16V
AE1
AC2 0.1uF
AC1 0.1uF
AC3
MM1565
AC101
AUD3.3V
AC5
AC4
AC6
AE2
MM1563
AR20
000(2012)
AR52
000
AR51
000
ADR001
000(3216)
GND
AIC9
PCM1802
BCK
DOUT
DGND
VDD
SCKI
OSR
FMT0
FMT1
MODE0
MODE1
LRCK
FSYNC
BYPAS
PDWN
AGND
VCC
VREF2
VREF1
VINR
VINL
AR813
4.7K
AR814
4.7K
AR809
2K
DELETE
AR812
2K
AR811 2K
AC908
222
AR053
000(3216)
AD3.3V
AC912
222
22uF/16V
AC913
AC914
222
10uF/16V
AC915
AC917
AL12V
AC816
100pF
AR801
4.7K
AC818
100pF
AR802
4.7K
AC824
182
AC8912
0.1UF
AR881
47K
AR882
47K
AC831
4560
22uF/16V
AIC82
OPB+
OPB-
OUTB
VCC
VEE
OPA+
OPA-
OUTA
AR808
3.3K
AR807
1.2K
AC823
330pF
AR806
4.7K
AC821
182
AC892
0.1UF
AR894
47K
AR895 47K
AC822
22uF/16V
AIC81
AR804
3.3K
AR805
1.2K
AC820
330pF
AR803
4.7K

11-7 Video Decoder (DVD PCB)


Video
MM1561
AD3.3V
V1.8V
Cb/B_IN
Y/G_IN
Cr/R_IN
Y_IN
C_IN
CVBS_IN
AGND
SCL
SDA
/RSTAV
FROM MAIN CONNECTOR
TIC1
TVP5146
TO AV CODEC
VI_VSYNC
VI_D[0]
VI_D[1]
VI_D[2]
VI_D[3]
VI_D[4]
VI_D[5]
VI_D[6]
VI_D[7]
VI_D[8]
VI_D[9]
VI_CLK
FSS_GP
GND
TNR60 4.7KR
TNR54 33RP
TNR50 33RP
TR73 100
TR44 33
TR43 33
TR40 33
TC100 33pF
TR35 100
TR34 100
TC80 000(2012)
TC7 000(2012)
TC16 000(2012)
TC9 000(2012)
TC18 000(2012)
TC23 000(2012)
TL9 000(3216)
TL8 000(3216)
TL7 000(3216)
TR281 OPEN
TR291 OPEN

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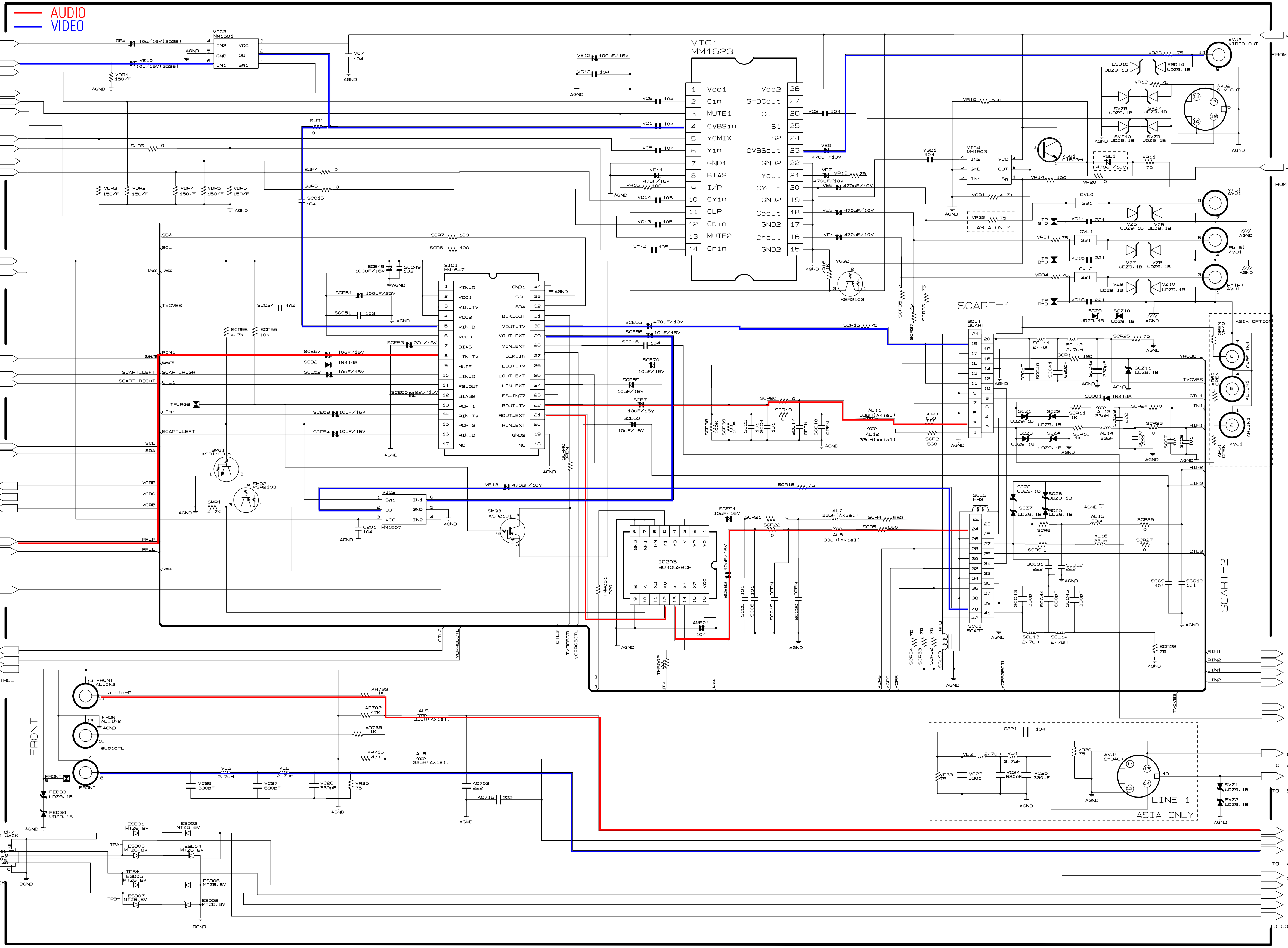
11-8 I/O (Jack PCB)


AUDIO
VIDEO
OSD_VOUT
FROM OSD
CVBS_
C_
FROM CONNECTION
OSD_SEL
PI_FRONT
COMP_MUTE
FROM SYSTEM CONTROL
VBS_
Cr/R_
Cb/B_
Y/G_
FROM CONNECTION
VAD5V
12VCC
FROM POWER
SAMUTE
SCART_LEFT
SCART_RIGHT
FROM TO AUDIO OUT
SCL
SDA
FROM SYSTEM CONTROL
VCRR
VCRG
VCRB
TO CONNECTION
RF_R
RF_L
FROM A2/NICAM
Decoder_CVBS
FROM OSD
CTL2
VCRRGBCTL
CVBS_SNS1
FROM TO SYSTEM CONTROL
VIC3
MM1501
VIC1
MM1623
Vcc1
Cin
MUTE1
CVBSin
YCMIX
Yin
GND1
BIAS
I/P
CYin
CLP
Cbin
MUTE2
Crin
Vcc2
S-DCout
Cout
S1
S2
CVBSout
GND2
Yout
CYout
Cbout
Crout
SIC1
MM1647
VIC4
MM1503
VQ01
VQ02
KSR2103
SCART-1
SCJ1
SCART
SCART-2
ASIA OPTION
ASIA ONLY
TVRGBCTL
TVCVBS
VIC2
MM1507
SMQ1
KSR1103
SMQ2
KSR2103
SMQ3
KSR2101
IC203
BU4052BCF
AVJ2
VIDEO_OUT
AVJ2
S-V_OUT
Y(G)
AVJ1
Pb(B)
AVJ1
Pr(R)
AVJ1
RGB_SW
FROM POWER
FROM SYSTEM CONTROL
RIN1
RIN2
LIN1
LIN2
TVCVBS
VIN_EXT
FRONT
AL-IN2
audio-R
audio-L
FRONT
LINE 1
ASIA ONLY
AVJ1
S-JACK
S_VID_IN
TO AV INPUT SEL
SV_SNS1
TO SYSTEM CONTROL
FRONT_R
FRONT_L
FRONT_V
TO AV INPUT SEL
IEEE1394 JACK
CN7
DV JACK
DGND
TPA-
TPA+
TPB+
TPB-
C_IN
TO CONNECTION
AGND

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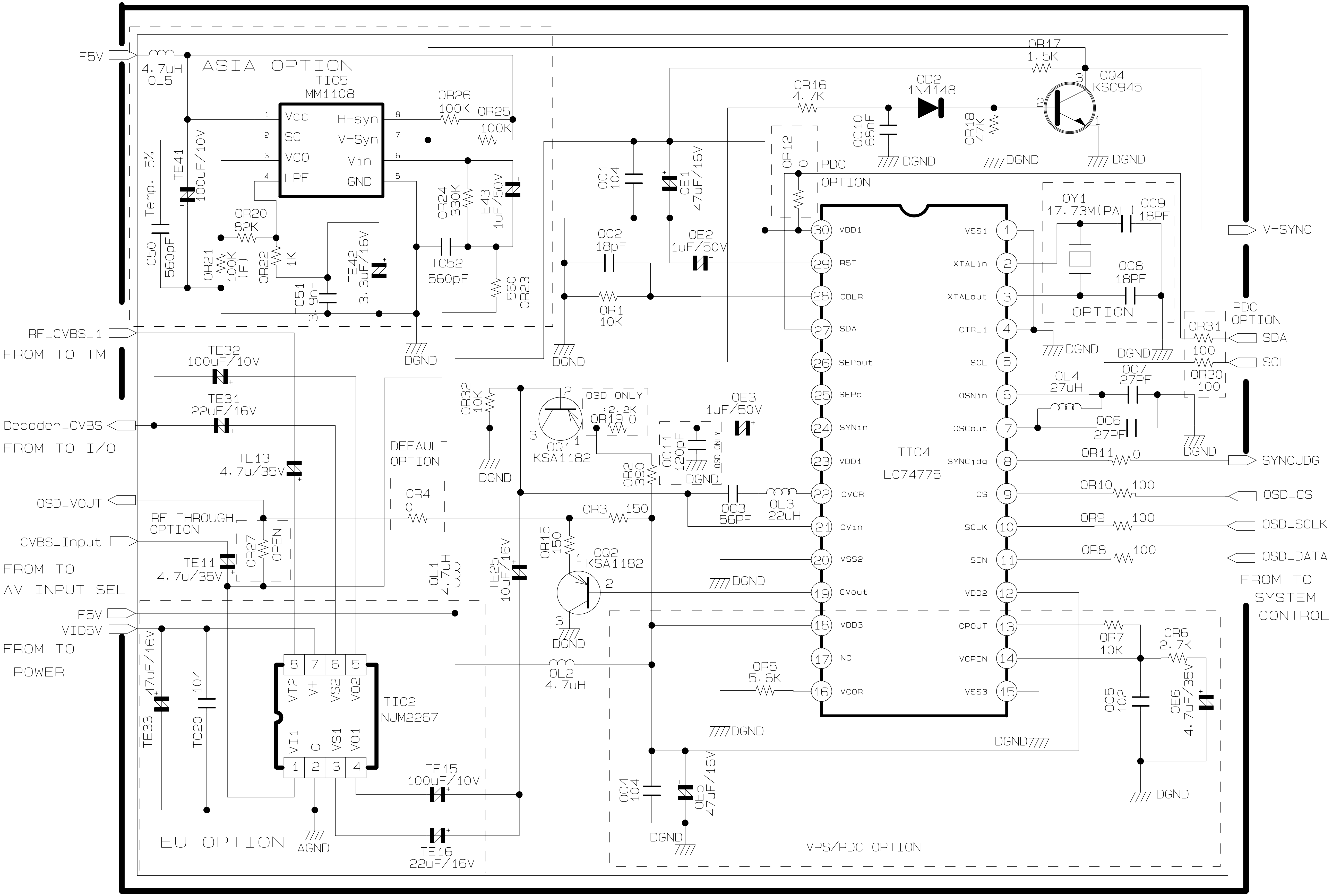
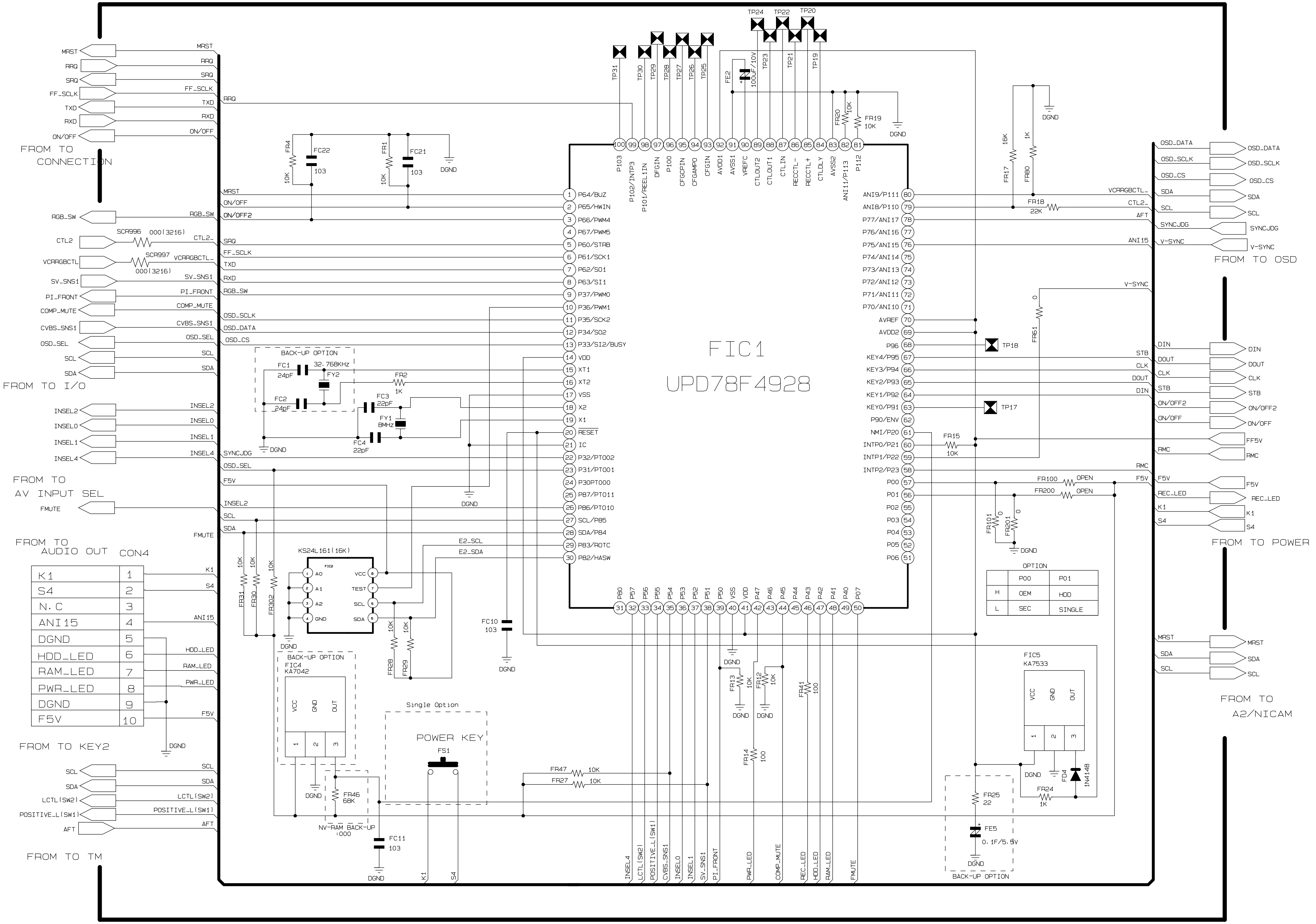
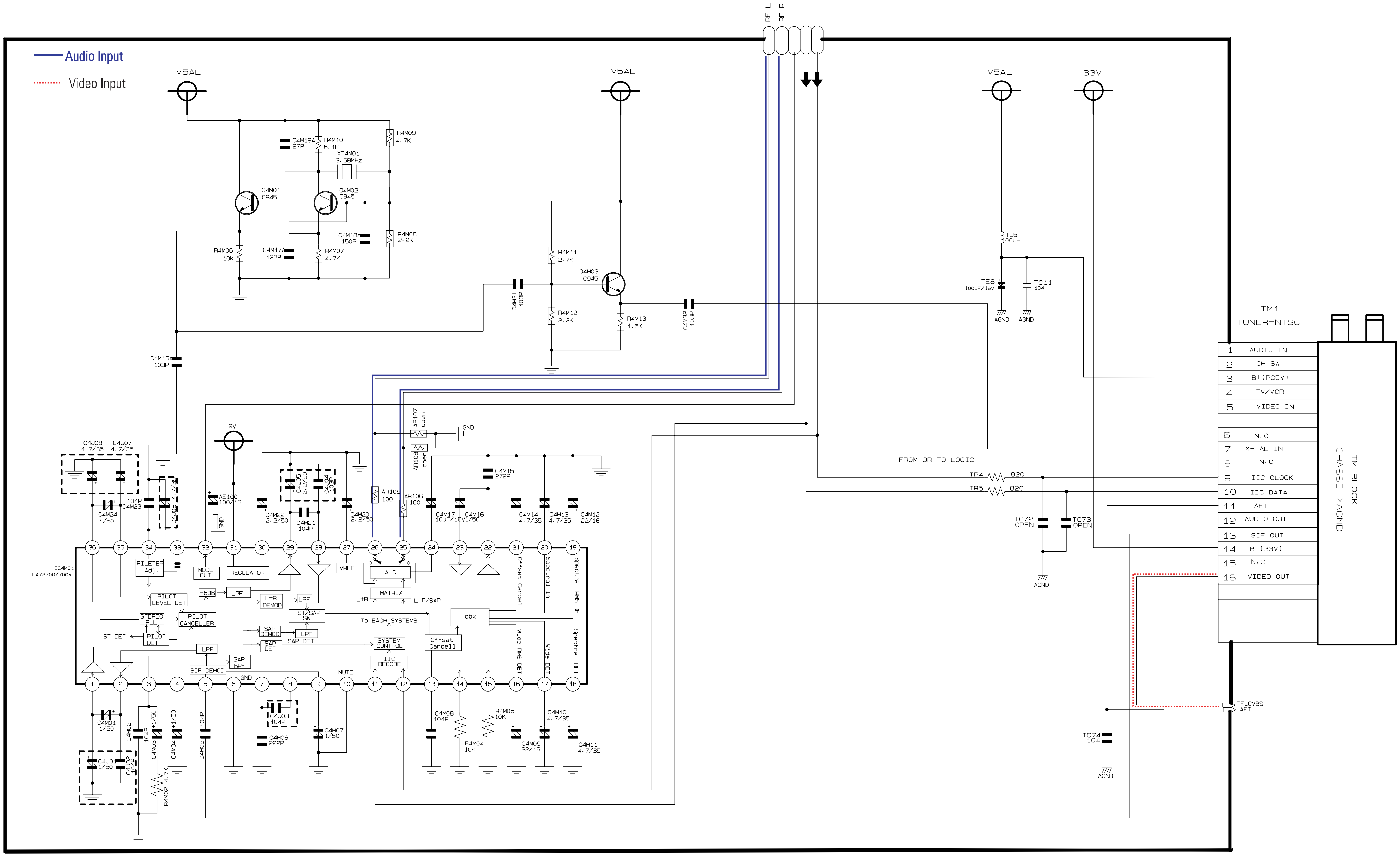
11-9 OSD (Jack PCB)


F5V
4.7uH
OL5
ASIA OPTION
TIC5
MM1108
Vcc
SC
VCO
LPF
H-syn
V-Syn
Vin
GND
OR26
100K
OR25
100K
Temp. 5%
TE41
100uF/10V
TC50
560pF
OR20
82K
OR21
100K
(F)
OR22
1K
TC51
3.9nF
TE42
3.3uF/16V
OR24
330K
TE43
1uF/50V
TC52
560pF
560
OR23
DGND
OR17
1.5K
OQ4
KSC945
OR16
4.7K
OD2
1N4148
OC10
68nF
OR18
47K
OC1
104
TE1
47uF/16V
OR12
0
PDC
OPTION
OC2
18pF
OE2
1uF/50V
OR1
10K
OY1
17.73M(PAL)
OC9
18PF
OC8
18PF
OPTION
V-SYNC
PDC
OPTION
OR31
100
OR30
100
SDA
SCL
RF_CVBS_1
FROM TO TM
TE32
100uF/10V
TE31
22uF/16V
Decoder_CVBS
FROM TO I/O
TE13
4.7u/35V
OSD_VOUT
RF THROUGH
OPTION
CVBS_Input
FROM TO
AV INPUT SEL
TE11
4.7u/35V
OR27
OPEN
DEFAULT
OPTION
OR4
0
OR32
10K
OQ1
KSA1182
OSD ONLY
2.2K
OR19 0
OC11
120pF
OSD ONLY
OE3
1uF/50V
OR2
390
OR3 150
OC3
56PF
OL3
22uH
OL1
4.7uH
TE25
10uF/16V
OR15
150
OQ2
KSA1182
F5V
VID5V
FROM TO
POWER
TE33
47uF/16V
TC20
104
TIC2
NJM2267
VI2
V+
VS2
VO2
VI1
G
VS1
VO1
TE15
100uF/10V
TE16
22uF/16V
EU OPTION
AGND
OL2
4.7uH
TIC4
LC74775
VDD1
RST
CDLR
SDA
SEPout
SEPc
SYNin
VDD1
CVCR
CVin
VSS2
CVout
VDD3
NC
VCOR
VSS1
XTALin
XTALout
CTRL1
SCL
OSNin
OSCout
SYNCjdg
CS
SCLK
SIN
VDD2
CPOUT
VCPIN
VSS3
OL4
27uH
OC7
27PF
OC6
27PF
OR11 0
SYNCJDG
OR10 100
OSD_CS
OR9 100
OSD_SCLK
OR8 100
OSD_DATA
FROM TO
SYSTEM
CONTROL
OR5
5.6K
OR7
10K
OR6
2.7K
OC5
102
OE6
4.7uF/35V
OC4
104
OE5
47uF/16V
VPS/PDC OPTION

11-10 System Control (Jack PCB)


FIC1
UPD78F4928
FROM TO CONNECTION
FROM TO I/O
FROM TO AV INPUT SEL
FROM TO AUDIO OUT
CON4
FROM TO KEY2
FROM TO TM
FROM TO OSD
FROM TO POWER
FROM TO A2/NICAM
MRST
RRQ
SRQ
FF_SCLK
TXD
RXD
ON/OFF
RGB_SW
CTL2
VCRRGBCTL
SV_SNS1
PI_FRONT
COMP_MUTE
CVBS_SNS1
OSD_SEL
SCL
SDA
INSEL2
INSEL0
INSEL1
INSEL4
FMUTE
SCR996 000(3216)
SCR997 000(3216)
K1 1
S4 2
N.C 3
ANI15 4
DGND 5
HDD_LED 6
RAM_LED 7
PWR_LED 8
DGND 9
F5V 10
LCTL(SW2)
POSITIVE_L(SW1)
AFT
1 P64/BUZ
2 P65/HWIN
3 P66/PWM4
4 P67/PWM5
5 P60/STRB
6 P61/SCK1
7 P62/SO1
8 P63/SI1
9 P37/PWM0
10 P36/PWM1
11 P35/SCK2
12 P34/SO2
13 P33/SI2/BUSY
14 VDD
15 XT1
16 XT2
17 VSS
18 X2
19 X1
20 RESET
21 IC
22 P32/PTO02
23 P31/PTO01
24 P30PTO00
25 P87/PTO11
26 P86/PTO10
27 SCL/P85
28 SDA/P84
29 P83/ROTC
30 P82/HASW
80 ANI9/P111
79 ANI8/P110
78 P77/ANI17
77 P76/ANI16
76 P75/ANI15
75 P74/ANI14
74 P73/ANI13
73 P72/ANI12
72 P71/ANI11
71 P70/ANI10
70 AVREF
69 AVDD2
68 P96
67 KEY4/P95
66 KEY3/P94
65 KEY2/P93
64 KEY1/P92
63 KEY0/P91
62 P90/ENV
61 NMI/P20
60 INTP0/P21
59 INTP1/P22
58 INTP2/P23
57 P00
56 P01
55 P02
54 P03
53 P04
52 P05
51 P06
100 P103
99 P102/INTP3
98 P101/REEL1IN
97 DFGIN
96 P100
95 CFGCPIN
94 CFGAMPO
93 CFGIN
92 AVDD1
91 AVSS1
90 VREFC
89 CTLOUT2
88 CTLOUT1
87 CTLIN
86 RECCTL-
85 RECCTL+
84 CTLDLY
83 AVSS2
82 ANI11/P113
81 P112
31 P80
32 P57
33 P56
34 P55
35 P54
36 P53
37 P52
38 P51
39 P50
40 VSS
41 VDD
42 P47
43 P46
44 P45
45 P44
46 P43
47 P42
48 P41
49 P40
50 P07
TP31 TP30 TP29 TP28 TP27 TP26 TP25 TP24 TP23 TP22 TP21 TP20 TP19 TP18 TP17
FE2 100uF/10V
FR20 10K
FR19 10K
FR4 10K
FC22 103
FR1 10K
FC21 103
DGND
BACK-UP OPTION
FC1 24pF
32.768KHz
FY2
FR2 1K
FC2 24pF
FC3 22pF
FY1 8MHz
FC4 22pF
KS24L161(16K)
FIC2
A0 A1 A2 GND VCC TEST SCL SDA
E2_SCL
E2_SDA
FR31 10K
FR30 10K
FR302 10K
FR28 10K
FR29 10K
FC10 103
FIC4 KA7042
VCC GND OUT
FR46 68K
NV-RAM BACK-UP :000
FC11 103
Single Option
POWER KEY
FS1
FR47 10K
FR27 10K
FR13 10K
FR12 10K
FR41 100
FR14 100
FR17 16K
FR80 1K
FR18 22K
FR61 0
FR15 10K
FR100 OPEN
FR200 OPEN
FR101 0
FR201 0
OPTION
P00 P01
H OEM HDD
L SEC SINGLE
FIC5 KA7533
FD4 1N4148
FR24 1K
FR25 22
FE5 0.1F/5.5V
OSD_DATA
OSD_SCLK
OSD_CS
SYNCJDG
V-SYNC
ANI15
DIN
DOUT
CLK
STB
ON/OFF2
FF5V
RMC
F5V
REC_LED
K1
S4
INSEL4
LCTL(SW2)
POSITIVE_L(SW1)
CVBS_SNS1
INSEL0
INSEL1
SV_SNS1
PI_FRONT
PWR_LED
COMP_MUTE
REC_LED
HDD_LED
RAM_LED
FMUTE

11-11 TM (Jack PCB)


Audio Input
Video Input
RF_L
RF_R
V5AL
33V
9V
C4M19A 27P
R4M10 5.1K
XT4M01 3.58MHz
R4M09 4.7K
Q4M01 C945
Q4M02 C945
Q4M03 C945
R4M06 10K
C4M17A 123P
R4M07 4.7K
C4M18A 150P
R4M08 2.2K
R4M11 2.7K
R4M12 2.2K
R4M13 1.5K
C4M31 103P
C4M32 103P
C4M16A 103P
TL5 100uH
TE8 100uF/16V
TC11 104
AGND
TM1
TUNER-NTSC
1 AUDIO IN
2 CH SW
3 B+(PC5V)
4 TV/VCR
5 VIDEO IN
6 N.C
7 X-TAL IN
8 N.C
9 IIC CLOCK
10 IIC DATA
11 AFT
12 AUDIO OUT
13 SIF OUT
14 BT(33V)
15 N.C
16 VIDEO OUT
TM BLOCK
CHASSI->AGND
FROM OR TO LOGIC
TR4 820
TR5 820
TC72 OPEN
TC73 OPEN
TC74 104
RF_CVBS
AFT
AR107 open
AR108 open
AR105 100
AR106 100
GND
IC4M01
LA72700/700V
C4J08 4.7/35
C4J07 4.7/35
C4M24 1/50
104P C4M23
C4J06 4.7/35
AE100 100/16
C4M22 2.2/50
C4J05 2.2/50
C4J04 103P
C4M21 104P
C4M20 2.2/50
C4M17 10uF/16V
C4M16 1/50
C4M15 272P
C4M14 4.7/35
C4M13 4.7/35
C4M12 22/16
FILETER Adj.
MODE OUT
REGULATOR
VREF
ALC
PILOT LEVEL DET
-6dB
LPF
L-R DEMOD
MATRIX
L+R
L-R/SAP
ST/SAP SW
STEREO PLL
PILOT CANCELLER
PILOT DET
ST DET
SAP DEMOD
SAP DET
SAP BPF
SIF DEMOD
To EACH SYSTEMS
SYSTEM CONTROL
IIC DECODE
MUTE
dbx
Offsat Cancell
Offset Cancel
Spectral In
Spectral RMS DET
Wide RMS DET
Wide DET
Spectral DET
C4M01 1/50
C4J01 1/50
C4J02 104P
C4M02 104P
C4M03 1/50
C4M04 1/50
C4M05 104P
R4M02 4.7K
C4J03 104P
C4M06 222P
C4M07 1/50
C4M08 104P
R4M04 10K
R4M05 10K
C4M09 22/16
C4M10 4.7/35
C4M11 4.7/35

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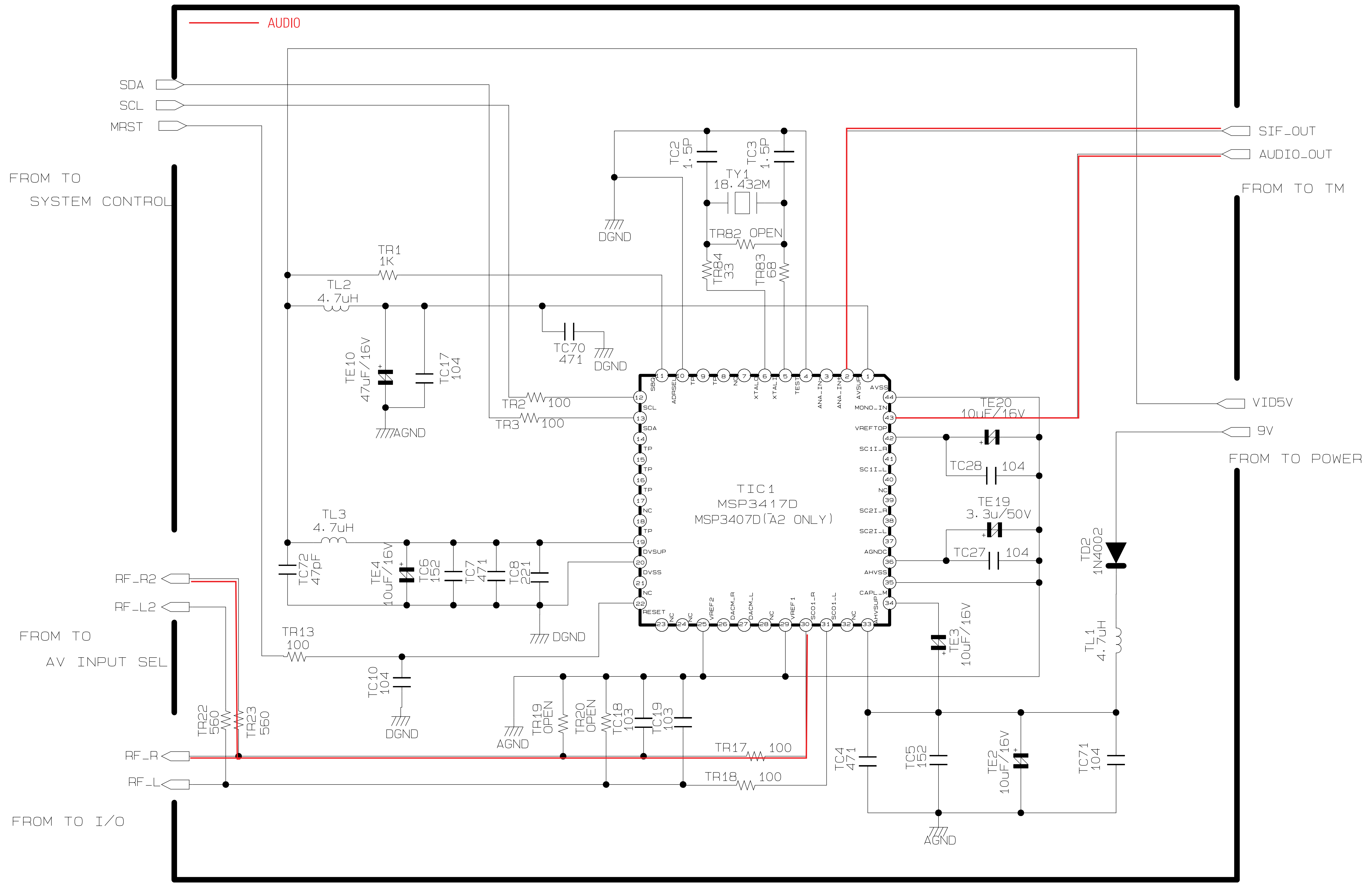
11-12 A2/NICAM (Jack PCB)


AUDIO
SDA
SCL
MRST
FROM TO
SYSTEM CONTROL
SIF_OUT
AUDIO_OUT
FROM TO TM
VID5V
9V
FROM TO POWER
RF_R2
RF_L2
FROM TO
AV INPUT SEL
RF_R
RF_L
FROM TO I/O
TC2 1.5P
TC3 1.5P
TY1 18.432M
TR82 OPEN
TR84 33
TR83 68
DGND
TR1 1K
TL2 4.7uH
TE10 47uF/16V
TC17 104
TC70 471
DGND
AGND
TR2 100
TR3 100
TIC1
MSP3417D
MSP3407D(A2 ONLY)
SBQ
ADRSEL
TP
TP
NC
XTALO
XTALI
TEST
ANA_IN-
ANA_IN+
AVSUP
AVSS
MONO_IN
VREFTOP
SC1I_R
SC1I_L
NC
SC2I_R
SC2I_L
AGNDC
AHVSS
CAPL_M
AHVSUP
SCL
SDA
TP
TP
TP
NC
TP
DVSUP
DVSS
NC
RESET
NC
NC
VREF2
DACM_R
DACM_L
NC
VREF1
SC01_R
SC01_L
NC
TE20 10uF/16V
TC28 104
TE19 3.3u/50V
TC27 104
TD2 1N4002
TL1 4.7uH
TE3 10uF/16V
TL3 4.7uH
TC72 47pF
TE4 10uF/16V
TC6 152
TC7 471
TC8 221
DGND
TR13 100
TC10 104
DGND
TR22 560
TR23 560
AGND
TR19 OPEN
TR20 OPEN
TC18 103
TC19 103
TR17 100
TR18 100
TC4 471
TC5 152
TE2 10uF/16V
TC71 104
AGND

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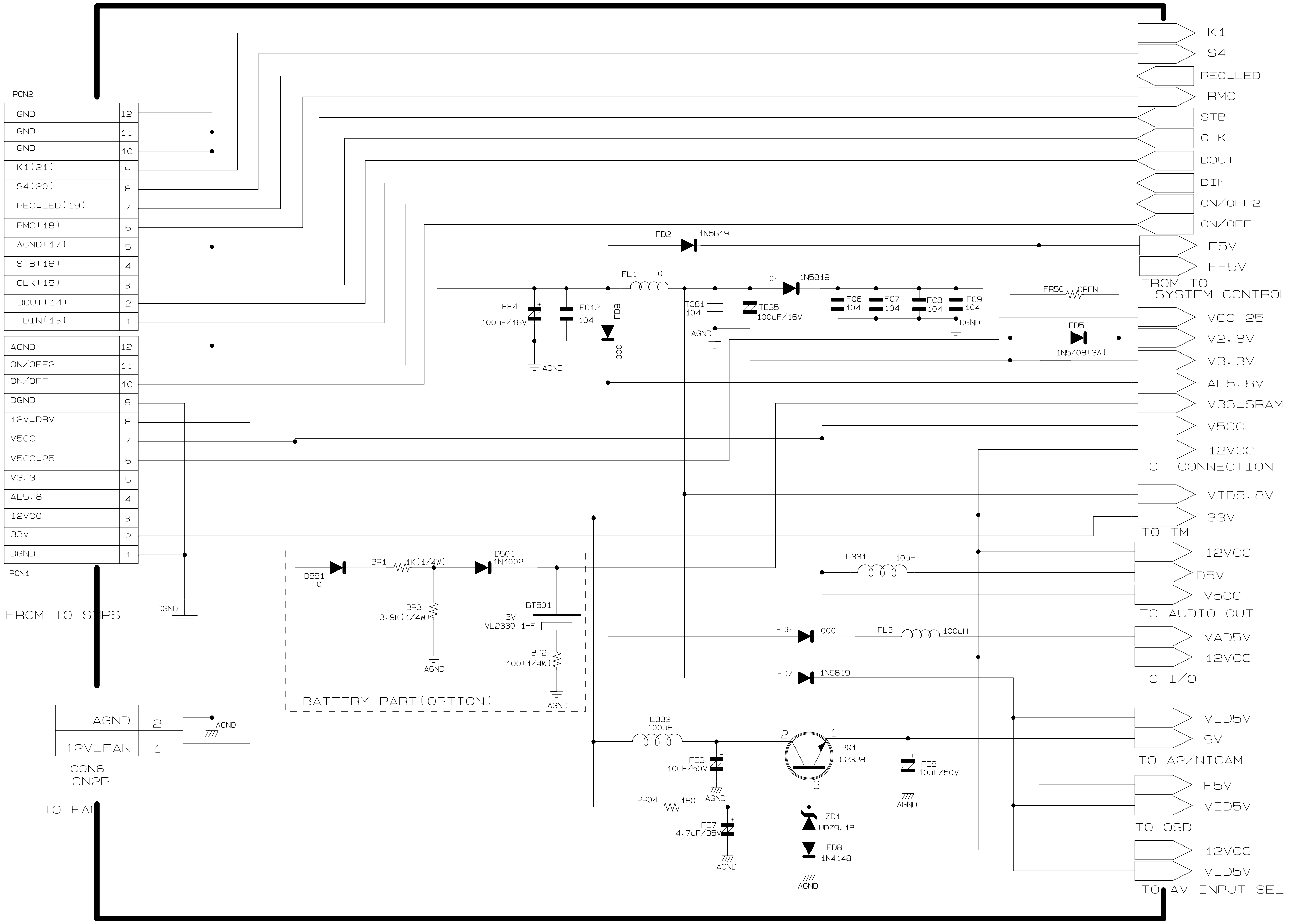
11-13 Power (Jack PCB)


PCN2
GND 12
GND 11
GND 10
K1(21) 9
S4(20) 8
REC_LED(19) 7
RMC(18) 6
AGND(17) 5
STB(16) 4
CLK(15) 3
DOUT(14) 2
DIN(13) 1
AGND 12
ON/OFF2 11
ON/OFF 10
DGND 9
12V_DRV 8
V5CC 7
V5CC_25 6
V3.3 5
AL5.8 4
12VCC 3
33V 2
DGND 1
PCN1
FROM TO SMPS
DGND
AGND 2
12V_FAN 1
AGND
CON6
CN2P
TO FAN
FE4
100uF/16V
FC12
104
AGND
FD9
000
FL1
0
FD2
1N5819
TC81
104
AGND
TE35
100uF/16V
FD3
1N5819
FC6
104
FC7
104
FC8
104
FC9
104
DGND
FR50
OPEN
FD5
1N5408(3A)
D551
0
BR1
1K(1/4W)
D501
1N4002
BR3
3.9K(1/4W)
AGND
BT501
3V
VL2330-1HF
BR2
100(1/4W)
AGND
BATTERY PART(OPTION)
L331
10uH
FD6
000
FL3
100uH
FD7
1N5819
L332
100uH
FE6
10uF/50V
AGND
2
1
3
PQ1
C2328
FE8
10uF/50V
AGND
PR04
180
FE7
4.7uF/35V
AGND
ZD1
UDZ9.1B
FD8
1N4148
AGND
K1
S4
REC_LED
RMC
STB
CLK
DOUT
DIN
ON/OFF2
ON/OFF
F5V
FF5V
FROM TO SYSTEM CONTROL
VCC_25
V2.8V
V3.3V
AL5.8V
V33_SRAM
V5CC
12VCC
TO CONNECTION
VID5.8V
33V
TO TM
12VCC
D5V
V5CC
TO AUDIO OUT
VAD5V
12VCC
TO I/O
VID5V
9V
TO A2/NICAM
F5V
VID5V
TO OSD
12VCC
VID5V
TO AV INPUT SEL

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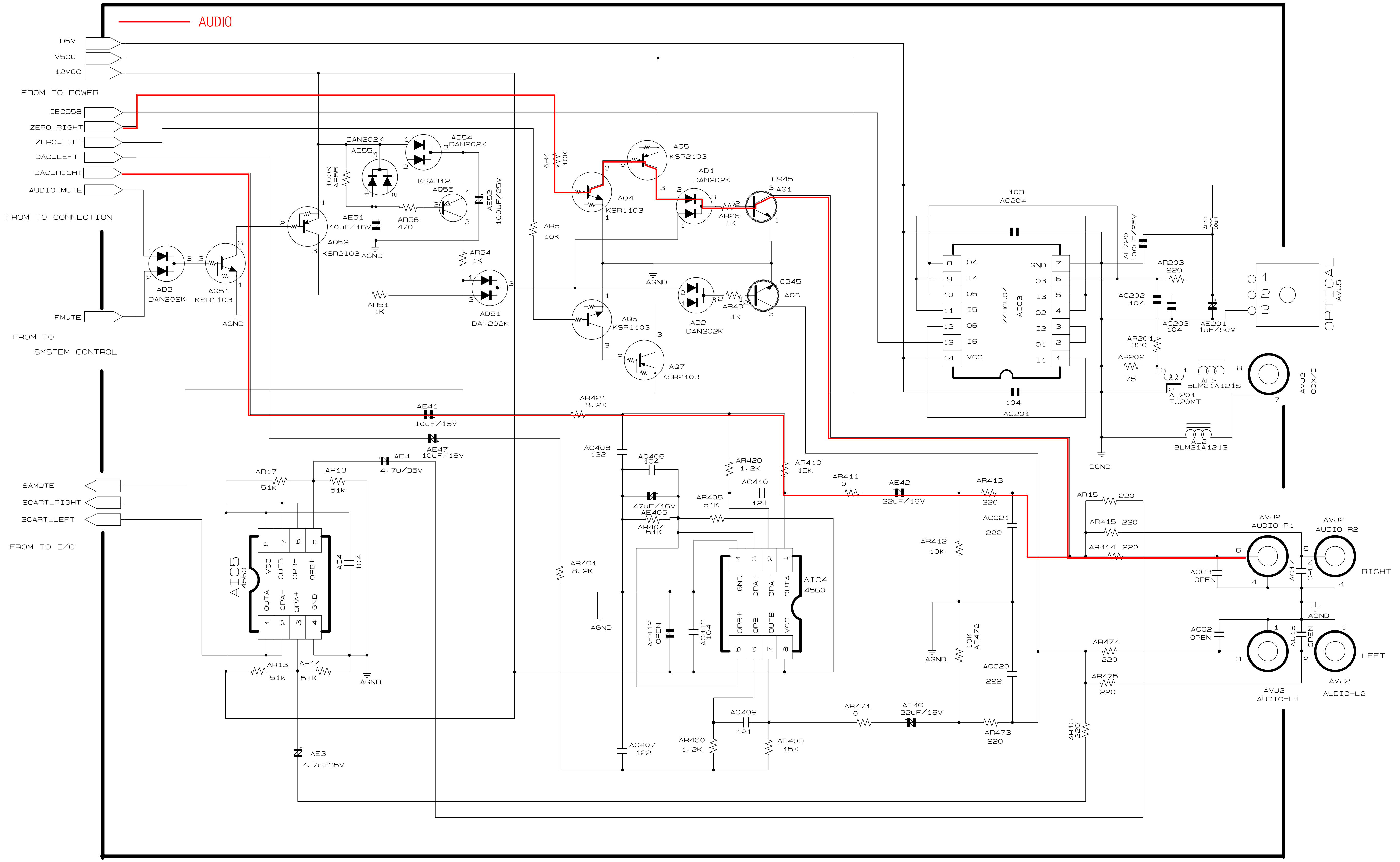
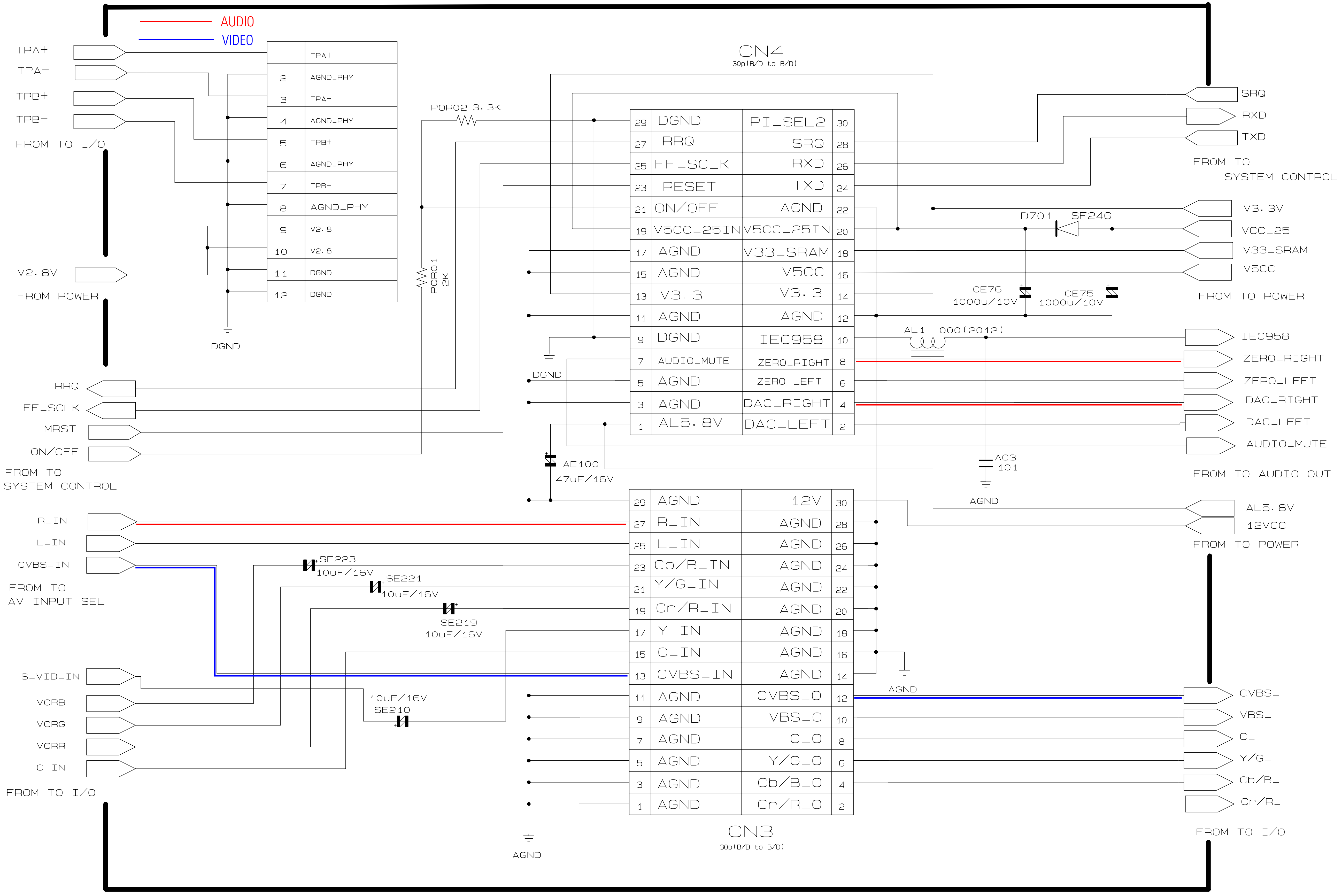
11-14 Audio Out (Jack PCB)


AUDIO
D5V
V5CC
12VCC
FROM TO POWER
IEC958
ZERO_RIGHT
ZERO_LEFT
DAC_LEFT
DAC_RIGHT
AUDIO_MUTE
FROM TO CONNECTION
FMUTE
FROM TO
SYSTEM CONTROL
SAMUTE
SCART_RIGHT
SCART_LEFT
FROM TO I/O
DAN202K
AD55
AD54
DAN202K
100K
AR55
KSA812
AQ55
AE52
100uF/25V
AE51
10uF/16V
AR56
470
AQ52
KSR2103
AGND
AR54
1K
AR5
10K
AR4
10K
AQ5
KSR2103
AD1
DAN202K
C945
AQ1
AQ4
KSR1103
AR26
1K
AD3
DAN202K
AQ51
KSR1103
AR51
1K
AD51
DAN202K
C945
AQ3
AR40
1K
AD2
DAN202K
AQ6
KSR1103
AQ7
KSR2103
AR421
8.2K
AE41
10uF/16V
AE47
10uF/16V
AE4
4.7u/35V
AR17
51K
AR18
51K
AIC5
4560
VCC
OUTB
OPB-
OPB+
OUTA
OPA-
OPA+
GND
AC4
104
AR13
51K
AR14
51K
AE3
4.7u/35V
AR461
8.2K
AC408
122
AC406
104
AE405
47uF/16V
AR404
51K
AR408
51K
AR420
1.2K
AC410
121
AR410
15K
AR411
0
AE42
22uF/16V
AR413
220
ACC21
222
AR412
10K
AE412
OPEN
AC413
104
AIC4
4560
GND
OPA+
OPA-
OUTA
OPB+
OPB-
OUTB
VCC
AC409
121
AC407
122
AR460
1.2K
AR409
15K
AR471
0
AE46
22uF/16V
AR473
220
ACC20
222
10K
AR472
103
AC204
74HCU04
AIC3
O4
I4
O5
I5
O6
I6
VCC
GND
O3
I3
O2
I2
O1
I1
104
AC201
AE720
100uF/25V
AL10
10uH
AR203
220
AC202
104
AC203
104
AE201
1uF/50V
AR201
330
AR202
75
AL201
TU20MT
AL3
BLM21A121S
AL2
BLM21A121S
OPTICAL
AVJ5
AVJ2
COX/D
DGND
AR15
220
AR415
220
AR414
220
AVJ2
AUDIO-R1
AVJ2
AUDIO-R2
RIGHT
ACC3
OPEN
AC17
OPEN
AGND
ACC2
OPEN
AC16
OPEN
LEFT
AR474
220
AR475
220
AVJ2
AUDIO-L1
AVJ2
AUDIO-L2
AR16
220

11-15 Jack Connector (Jack PCB)


AUDIO
VIDEO
TPA+
TPA−
TPB+
TPB−
FROM TO I/O
1 TPA+
2 AGND_PHY
3 TPA−
4 AGND_PHY
5 TPB+
6 AGND_PHY
7 TPB−
8 AGND_PHY
9 V2.8
10 V2.8
11 DGND
12 DGND
DGND
V2.8V
FROM POWER
POR02 3.3K
POR01 2K
CN4
30p(B/D to B/D)
29 DGND
30 PI_SEL2
27 RRQ
28 SRQ
25 FF_SCLK
26 RXD
23 RESET
24 TXD
21 ON/OFF
22 AGND
19 V5CC_25IN
20 V5CC_25IN
17 AGND
18 V33_SRAM
15 AGND
16 V5CC
13 V3.3
14 V3.3
11 AGND
12 AGND
9 DGND
10 IEC958
7 AUDIO_MUTE
8 ZERO_RIGHT
5 AGND
6 ZERO_LEFT
3 AGND
4 DAC_RIGHT
1 AL5.8V
2 DAC_LEFT
SRQ
RXD
TXD
FROM TO
SYSTEM CONTROL
D701
SF24G
V3.3V
VCC_25
V33_SRAM
V5CC
CE76
1000u/10V
CE75
1000u/10V
FROM TO POWER
AL1
000(2012)
IEC958
ZERO_RIGHT
ZERO_LEFT
DAC_RIGHT
DAC_LEFT
AUDIO_MUTE
AC3
101
AGND
FROM TO AUDIO OUT
RRQ
FF_SCLK
MRST
ON/OFF
FROM TO
SYSTEM CONTROL
DGND
AE100
47uF/16V
AL5.8V
12VCC
FROM TO POWER
R_IN
L_IN
CVBS_IN
FROM TO
AV INPUT SEL
SE223
10uF/16V
SE221
10uF/16V
SE219
10uF/16V
10uF/16V
SE210
S_VID_IN
VCRB
VCRG
VCRR
C_IN
FROM TO I/O
29 AGND
30 12V
27 R_IN
28 AGND
25 L_IN
26 AGND
23 Cb/B_IN
24 AGND
21 Y/G_IN
22 AGND
19 Cr/R_IN
20 AGND
17 Y_IN
18 AGND
15 C_IN
16 AGND
13 CVBS_IN
14 AGND
11 AGND
12 CVBS_O
9 AGND
10 VBS_O
7 AGND
8 C_O
5 AGND
6 Y/G_O
3 AGND
4 Cb/B_O
1 AGND
2 Cr/R_O
AGND
CN3
30p(B/D to B/D)
AGND
CVBS_
VBS_
C_
Y/G_
Cb/B_
Cr/R_
FROM TO I/O

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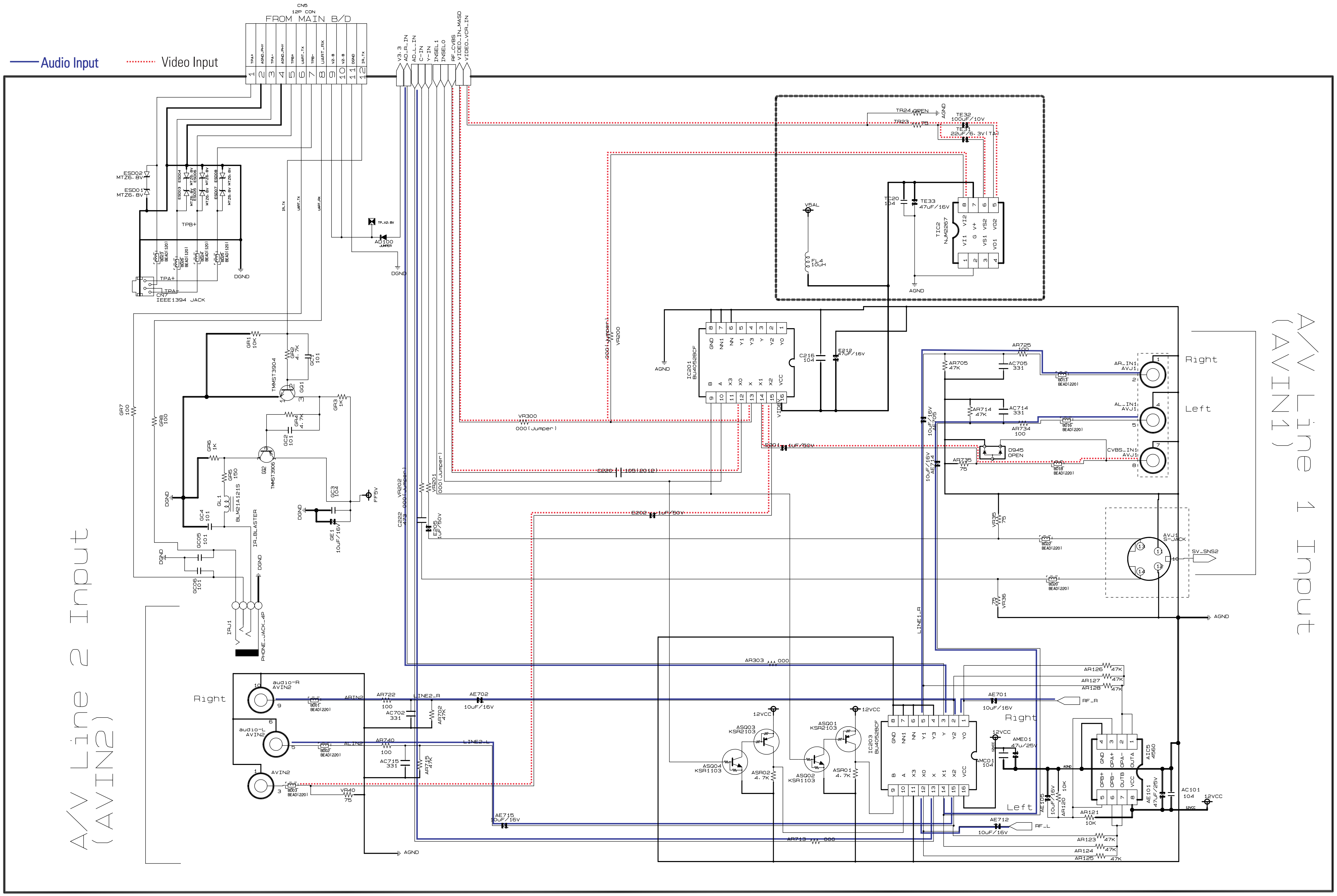
11-16 AV Input Sellection (Jack PCB)


Audio Input
Video Input
CN5
12P CON
FROM MAIN B/D
TPA+
AGND_PHY
TPA-
AGND_PHY
TPB+
UART_TX
TPB-
UART_RX
V2.8
V2.8
DGND
IR_TX
V3.3
AD_R_IN
AD_L_IN
C-IN
Y-IN
INSEL1
INSEL0
RF_CVBS
VIDEO_IN_MASD
VIDEO_VCR_IN
ESD02 MTZ6.8V
ESD01 MTZ6.8V
ESD03
ESD04
ESD05
ESD06
ESD07
ESD08
MTZ6.8V
TPB+
BD23 BEAD(120)
BD26 BEAD(120)
BD24 BEAD(120)
BD25 BEAD(120)
DGND
TPA+
TPA-
CN7
IEEE1394 JACK
IR_TX
UART_TX
UART_RX
TP_V2.8V
AD100
JUMPER
DGND
GR1 10K
GR2 4.7K
GC1 101
TMMST3904
GQ1
GR3 1K
GR4 4.7K
GC2 101
GR6 1K
GR5 150
GQ2
TMMST3906
GR7 100
GR8 100
GL1
BLM21A121S
GC3 104
FF5V
GE1 10uF/16V
GC4 101
GC05 101
GC06 101
IR_BLASTER
IRJ1
PHONE_JACK_4P
A/V Line 2 Input
(AVIN2)
Right
audio-R
AVIN2
audio-L
AVIN2
AVIN2
BD01 BEAD(220)
BD02 BEAD(220)
BD03 BEAD(220)
ARIN2
ALIN2
AR722 100
AC702 331
AR702 47K
LINE2_R
AR740 100
AC715 331
AR715 47K
LINE2-L
VR40 75
AE702 10uF/16V
AE715 10uF/16V
AGND
VR202 000(Jumper)
C222 473
VR201 000(Jumper)
E205 1uF/50V
VR300 000(Jumper)
VR200 000(Jumper)
C220 105(2012)
E202 1uF/50V
E201 1uF/50V
TR24 OPEN
TR23 75
AGND
TE32 100uF/10V
TE31 22uF/6.3V(TA)
V5AL
FL4 10uH
TC20 104
TE33 47uF/16V
TIC2
NJM2267
VI1 G VS1 VO1
VI2 V+ VS2 VO2
AGND
IC201
BU4052BCF
GND NN1 NN Y1 Y3 Y Y2 Y0
B A X3 X0 X X1 X2 VCC
VIDEO
C216 104
E212 47uF/16V
AR725 100
AR705 47K
AC705 331
AR_IN1
AVJ1
BD13 BEAD(220)
Right
AR714 47K
AC714 331
AR734 100
AL_IN1
AVJ1
BD16 BEAD(220)
Left
AE705 10uF/16V
AE714 10uF/16V
AR735 75
D945 OPEN
CVBS_IN1
AVJ1
BD18 BEAD(220)
VR35 75
AVJ1
S-JACK
SV_SNS2
BD22 BEAD(220)
BD20 BEAD(220)
VR36 75
AGND
A/V Line 1 Input
(AVIN1)
LINE1_R
AR303 000
AR126 47K
AR127 47K
AR128 47K
12VCC
ASQ03 KSR2103
ASQ04 KSR1103
ASR02 4.7K
ASQ01 KSR2103
ASQ02 KSR1103
ASR01 4.7K
IC203
BU4052BCF
AE701 10uF/16V
RF_R
Right
AME01 47u/25V
AMC01 104
Left
AE105 10uF/16V
AR120 10K
AIC5 4560
GND OPA+ OPA- OUTA
OPB+ OPB- OUTB VCC
AE101 47uF/25V
AC101 104
AR121 10K
AE712 10uF/16V
RF_L
AR713 000
AR123 47K
AR124 47K
AR125 47K

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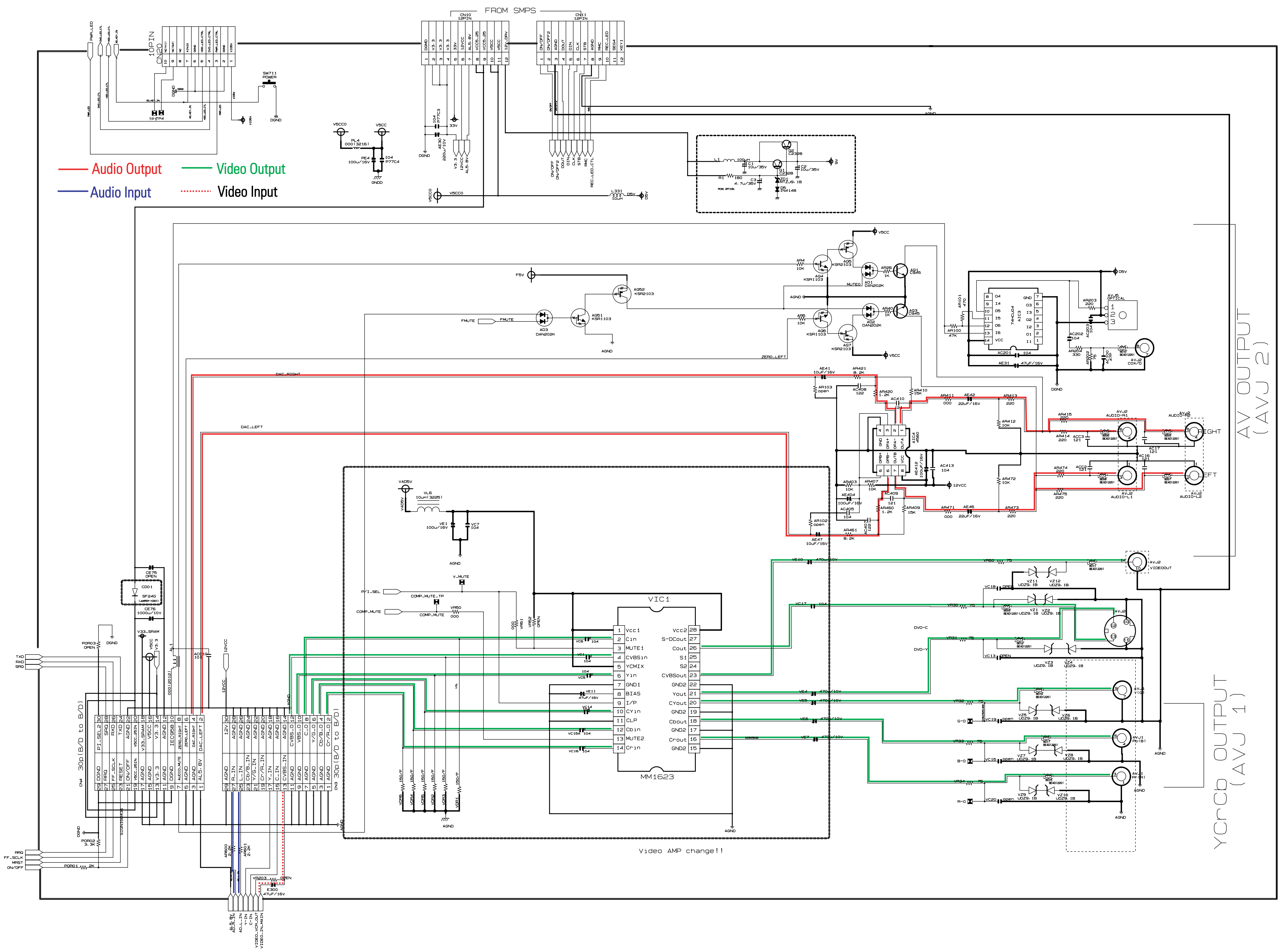
11-17 AV Output Sellection (Jack PCB)


Audio Output
Video Output
Audio Input
Video Input
FROM SMPS
CN10 12PIN
CN11 12PIN
10PIN CN20
SW711 POWER
V5CC0
V5CC
F5V
FMUTE
DAC_RIGHT
DAC_LEFT
ZERO_LEFT
74HCU04
AVJ2 OPTICAL
AVJ2 COX/D
AVJ2 AUDIO-R1
AVJ2 AUDIO-L1
AVJ2 AUDIO-R2
AVJ2 AUDIO-L2
RIGHT
LEFT
AV OUTPUT (AVJ 2)
AVJ2 VIDEOOUT
DVD-C
DVD-Y
AVJ1 Y(G)
AVJ1 Pb(B)
AVJ1 Pr(R)
YCrCb OUTPUT (AVJ 1)
VIC1
1 Vcc1
2 Cin
3 MUTE1
4 CVBSin
5 YCMIX
6 Yin
7 GND1
8 BIAS
9 I/P
10 CYin
11 CLP
12 Cbin
13 MUTE2
14 Crin
Vcc2 28
S-DCout 27
Cout 26
S1 25
S2 24
CVBSout 23
GND2 22
Yout 21
CYout 20
GND2 19
Cbout 18
GND2 17
Crout 16
GND2 15
MM1623
Video AMP change!!
P/I_SEL
COMP_MUTE
V_MUTE
CN4 30p(B/D to B/D)
CN3 30p(B/D to B/D)
TXD
RXD
SRQ
RRQ
FF_SCLK
MRST
ON/OFF

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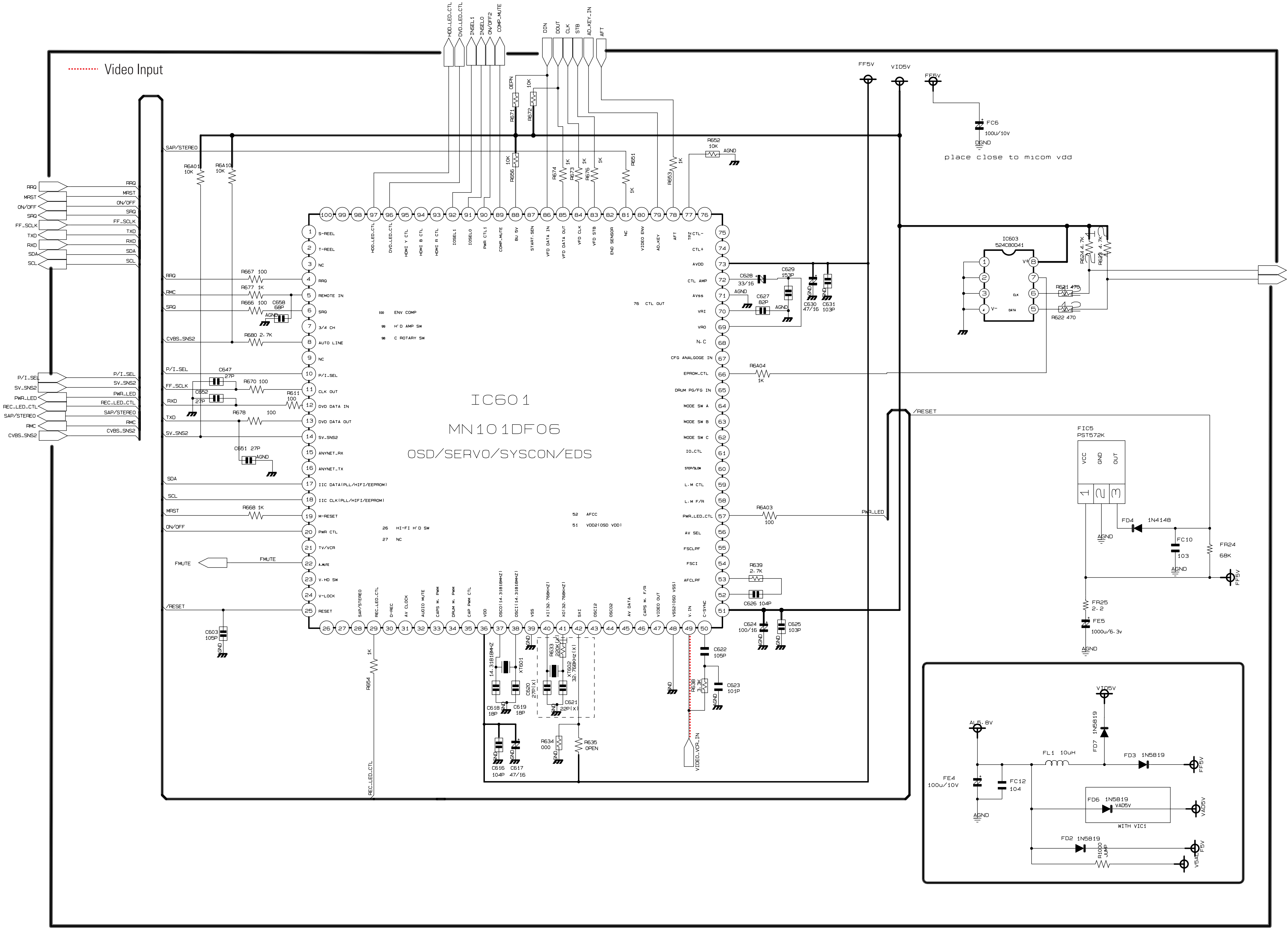
11-18 Micom (Jack PCB)


Video Input
IC601
MN101DF06
OSD/SERVO/SYSCON/EDS
IC603
524C80D41
FIC5
PST572K
place close to micom vdd
FF5V
VID5V
AL5.8V
FL1 10uH
FD3 1N5819
FD6 1N5819
FD2 1N5819
FD7 1N5819
WITH VIC1
/RESET
SCL
SDA
RRQ
MRST
ON/OFF
SRQ
FF_SCLK
TXD
RXD
P/I_SEL
SV_SNS2
PWR_LED
REC_LED_CTL
SAP/STEREO
RMC
CVBS_SNS2
FMUTE
VIDEO_VCR_IN
HDD_LED_CTL
DVD_LED_CTL
INSEL1
INSEL0
ON/OFF2
COMP_MUTE
DIN
DOUT
CLK
STB
AD_KEY_IN
AFT

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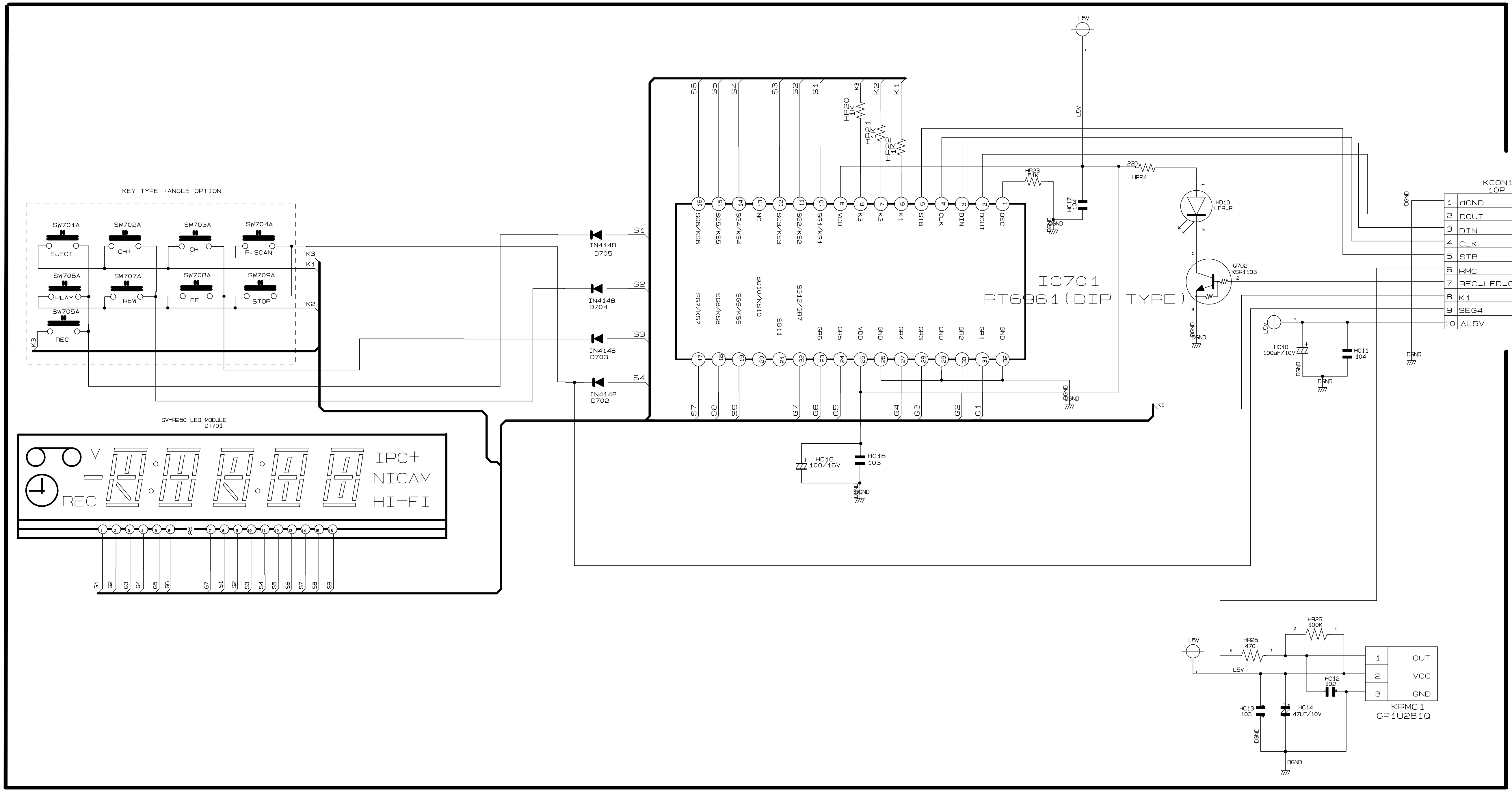
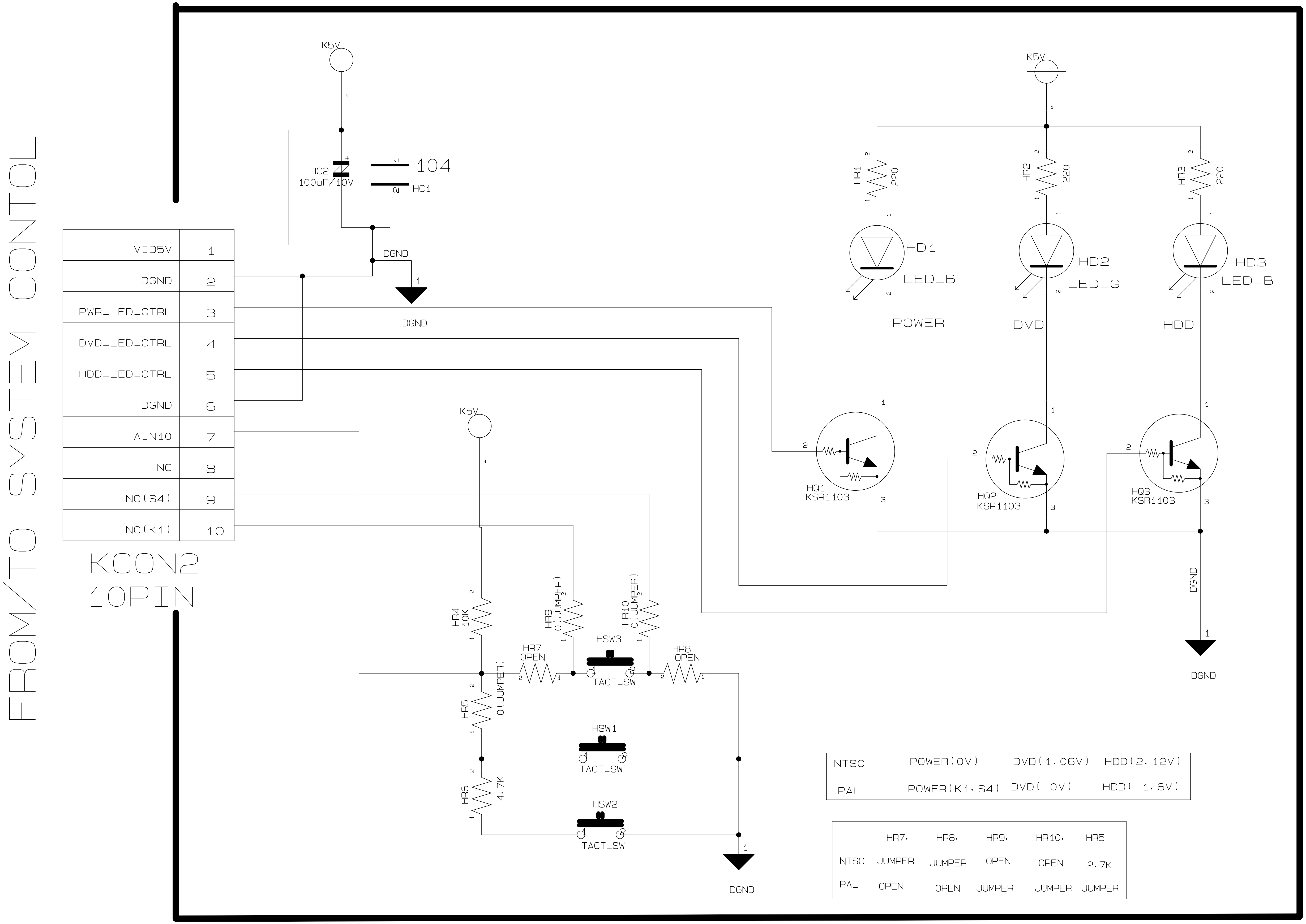
11-19 Right Key (Key PCB)


KEY TYPE :ANGLE OPTION
SW701A
EJECT
SW702A
CH+
SW703A
CH-
SW704A
P.SCAN
SW706A
PLAY
SW707A
REW
SW708A
FF
SW709A
STOP
SW705A
REC
K1
K2
K3
S1
S2
S3
S4
IN4148
D705
D704
D703
D702
IC701
PT6961(DIP TYPE)
SG6/KS6
SG5/KS5
SG4/KS4
NC
SG3/KS3
SG2/KS2
SG1/KS1
VDD
K3
K2
K1
STB
CLK
DIN
DOUT
OSC
SG7/KS7
SG8/KS8
SG9/KS9
SG10/KS10
SG11
SG12/GR7
GR6
GR5
GND
GR4
GR3
GR2
GR1
HR20 1K
HR21 1K
HR22 1K
HR23 51K
HC17 104
HR24 220
L5V
DGND
HD10 LER_R
Q702 KSR1103
KCON1 10P
1 dGND
2 DOUT
3 DIN
4 CLK
5 STB
6 RMC
7 REC_LED_CTRL
8 K1
9 SEG4
10 AL5V
HC10 100uF/10V
HC11 104
HC16 100/16V
HC15 103
SV-R250 LED MODULE
DT701
V
REC
IPC+
NICAM
HI-FI
G1 G2 G3 G4 G5 G6 G7 S1 S2 S3 S4 S5 S6 S7 S8 S9
HR25 470
HR26 100K
HC12 102
HC13 103
HC14 47UF/10V
1 OUT
2 VCC
3 GND
KRMC1
GP1U281Q
FROM/TO SMPS

11-20 Left Key (Key PCB)


FROM/TO SYSTEM CONTOL
VID5V 1
DGND 2
PWR_LED_CTRL 3
DVD_LED_CTRL 4
HDD_LED_CTRL 5
DGND 6
AIN10 7
NC 8
NC(S4) 9
NC(K1) 10
KCON2
10PIN
K5V
HC2
100uF/10V
104
HC1
DGND
HR1 220
HR2 220
HR3 220
HD1 LED_B
HD2 LED_G
HD3 LED_B
POWER
DVD
HDD
HQ1 KSR1103
HQ2 KSR1103
HQ3 KSR1103
HR4 10K
HR9 0(JUMPER)
HR10 0(JUMPER)
HR7 OPEN
HR8 OPEN
HSW3
TACT_SW
HR5 0(JUMPER)
HSW1
TACT_SW
HR6 4.7K
HSW2
TACT_SW

NTSC	POWER(0V)	DVD(1.06V)	HDD(2.12V)
PAL	POWER(K1,S4)	DVD(0V)	HDD(1.6V)

	HR7,	HR8,	HR9,	HR10,	HR5
NTSC	JUMPER	JUMPER	OPEN	OPEN	2.7K
PAL	OPEN	OPEN	JUMPER	JUMPER	JUMPER

MEMO

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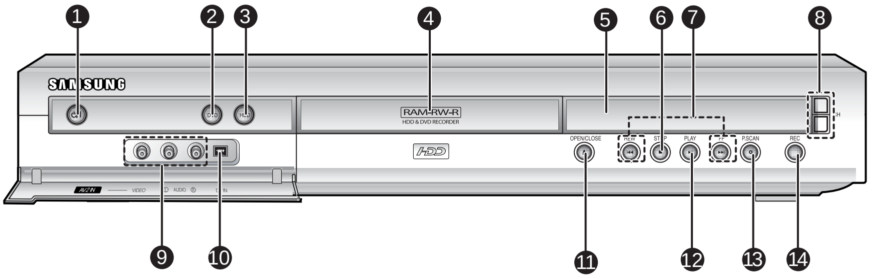
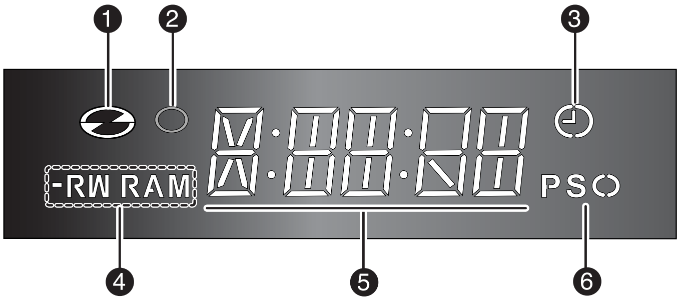
Description

Front Panel


1
2
3
4
5
6
7
8
SAMSUNG
RAM-RW-R
HDD & DVD RECORDER
HDD
OPEN/CLOSE
STOP
PLAY
P.SCAN
REC
AV2 IN
VIDEO
AUDIO
9
10
11
12
13
14

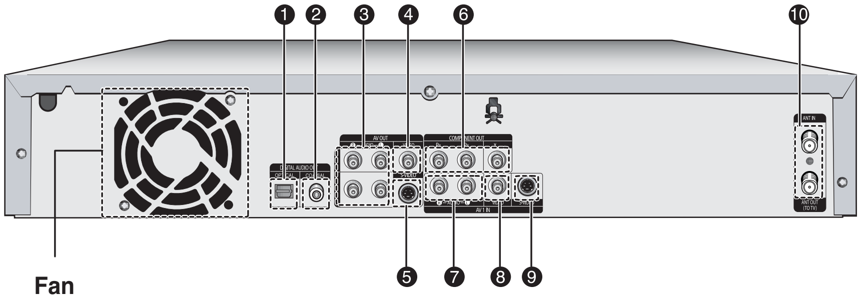
1. **POWER BUTTON**
   Turns the recorder on and off.
2. **DVD BUTTON**
   Select DVD mode.
3. **HDD BUTTON**
   Select HDD mode.
4. **DISC TRAY**
   Opens to accept a disc.
5. **DISPLAY**
   Displays the playing status, title/ chapter/ time, etc.
6. **STOP BUTTON**
   Stops disc playback.
7. **SEARCH/SKIP BUTTONS**
   Goes to the next title/chapter/track or goes back to the previous title/chapter/track.
8. **CH BUTTONS**
   Select TV preset Channels. Same as **CH** button on the remote control.
9. **AV 2 INPUT**
   Connect external equipment.
10. **DV-INPUT**
    Connect external digital equipment with a DV jack. (such as a camcorder)
11. **OPEN/CLOSE BUTTON**
    Opens and closes the disc tray.
12. **PLAY/PAUSE BUTTON**
    Plays a disc or pauses playback or recording.
13. **P.SCAN BUTTON**
    Selects the progressive scan mode.
14. **REC BUTTON**
    Starts recording.

Front Panel Display


1
2
3
-RW RAM
PSO
4
5
6

1. Lights when a disc is loaded.
2. Lights in the record mode.
3. Lights to indicate the timer record mode.
4. Lights when a -R/RW/RAM disc is loaded.
5. Playing time/clock/current status indicator.
6. Lights in the progressive scan mode.

Rear Panel



Fan

The fan always revolves when the power is on.
Ensure a minimum of 4” clear space on all sides of the fan when installing the product.

1. DIGITAL AUDIO OUT(OPTICAL)

Connects to an amplifier having a digital optical audio input jack.

2. DIGITAL AUDIO OUT(COAXIAL)

Connects to an amplifier having a digital coaxial audio input jack.

3. AV AUDIO OUT

Connects to the audio input of external equipment using audio cables.

4. AV VIDEO OUT(good video quality)

Connects the input of external equipment using a Video cable.

5. AV S-VIDEO OUT(better video quality)

Connects the input of external equipment using an S-Video cable.

6. COMPONENT VIDEO OUT(best video quality)

Connects to equipment having Component video input jacks.

7. AV 1 AUDIO IN

Connects the output of external equipment using an audio cables

8. AV 1 VIDEO IN

Connects the output of external equipment using a video cable.

9. AV 1 S- VIDEO IN

Connects the output of external equipment using an S-Video cable.

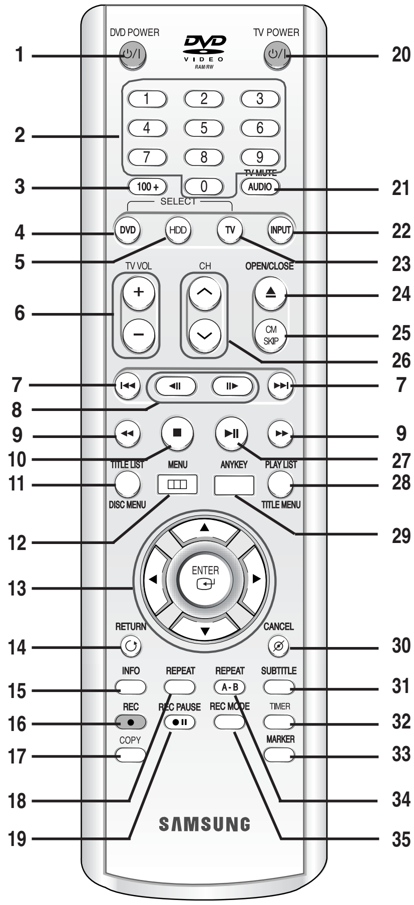
10. ANT IN/ANT OUT (TO TV)

Connects antenna cables.

NOTE

- The Antenna connection does not pass output signal of DVD. To watch a DVD on your TV, you must connect audio/video cables.

Tour of the Remote Control


DVD POWER
TV POWER
DVD VIDEO RAM/RW
1
2
3
4
5
6
7
8
9
0
100 +
TV MUTE
AUDIO
SELECT
DVD
HDD
TV
INPUT
TV VOL
CH
OPEN/CLOSE
CM SKIP
TITLE LIST
MENU
ANYKEY
PLAY LIST
DISC MENU
TITLE MENU
ENTER
RETURN
CANCEL
INFO
REPEAT
REPEAT A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER
SAMSUNG
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
7
9
27
28
29
30
31
32
33
34
35

1. **DVD POWER Button**
2. **NUMBER Buttons**
3. **100+ Button**
   Press this to select channel 100 or higher.
4. **DVD Button**
   Press this to operate DVD.
5. **HDD Button**
   Press this to operate HDD.
6. **TV VOL Button**
   TV volume adjustment
7. **REVERSE/FORWARD SKIP Buttons**
   Press to skip a disc backwards or forwards.
8. **REVERSE/FORWARD STEP Buttons**
   Each press will play one-frame forward or reverse.
9. **REVERSE/FORWARD SEARCH Buttons**
   Press to search a disc backwards or forwards.
10. **STOP Button**
    Press to stop a disc.
11. **TITLE LIST/DISC MENU Button**
    Use this to enter the View Recording list/disc menu.
12. **MENU Button**
    Brings up the HDD & DVD RECORDER's setup menu.
13. **ENTER/DIRECTION Buttons** (▲▼◀ ▶ Buttons)
14. **RETURN Button**
15. **INFO Button**
    This will display current setting or disc status.
16. **REC Button**
    Use to make a recording on HDD/DVD-RAM/-RW/-R discs.
17. **COPY Button**
    Press this when you copy DVD to HDD or HDD to DVD. To start copying, press the **COPY** button on the title list screen or press the **COPY** button during the playback.
18. **REPEAT Button**
    Allows you to repeat a title, chapter, track or disc.
19. **REC PAUSE Button**
    Use this to pause during recording.
20. **TV POWER Button**
21. **AUDIO/TV MUTE Button**
    Use this to access various audio functions on a disc (DVD mode).
    This operates as sound mute. (TV mode)
22. **INPUT Button**
    Select line input signal in external input mode. (Tuner, AV1, AV2 or DV Input)
23. **TV Button**
    Press this to operate TV.
24. **OPEN/CLOSE Button**
    To open and close the disc tray.
25. **CM SKIP Button**
    When a program recorded on DVD disc or HDD is played, the unit can be set to automatically skip a portion of the program.
26. **CH Button**
    Use this to select a TV channel.
27. **PLAY/PAUSE Button**
    Press to play/pause a disc.
28. **PLAY LIST/TITLE MENU Button**
    Use this to return to the Title menu, or to view the recorded files list.
29. **ANYKEY Button**
    View and select the applicable features under current status.
30. **CANCEL Button**
31. **SUBTITLE Button**
    Press this to switch the DVD's subtitle language.
32. **TIMER Button**
    Press to directly enter the Timer Recording Mode menu.
33. **MARKER Button**
    Use this to bookmark a position while playing a disc.
34. **REPEAT A-B Button**
    Allows you to repeat a title, chapter, track or disc.
35. **REC MODE Button**
    Use this to set the desired Recoring time and picture quality. (XP/SP/LP/EP)

Connecting & Setting up

This section involves various methods of connecting the HDD & DVD RECORDER to other external components and required initial setting modes.

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Step 3 : Connecting the Audio cable 23

Step 4 : Connecting External devices 24

Step 5 : Connecting the Power Cord 25

Quick Overview

A Quick Overview presented in this guide will give you enough information to start using the recorder.

Step 1 : Connecting the Antenna cable

▼

Step 2 : Connecting the Video cable

▼

Step 3 : Connecting the Audio cable

▼

Step 4 : Connecting External devices

▼

Step 5 : Connecting the Power cord

- ***Note to CATV system installer:*** This reminder is provided to call CATV system installer’s attention to Article 820-40 of the National Electrical Code (Section 54 of Canadian Electrical Code, Part I), that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

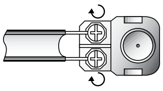
Step 1: Connecting the Antenna Cable

There are several ways to connect your HDD & DVD RECORDER. Select one of the following antenna connections that best suits you below.

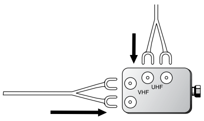
- Method 1 : Antenna + HDD & DVD RECORDER + TV : No Cable box
- Method 2 : Antenna +Cable box + HDD & DVD RECORDER + TV : Cable box with many scrambled channels
- Method 3 : Antenna + HDD & DVD RECORDER + Cable box +TV : Cable box with a few scrambled channels

NOTE

- If you are using an off-air antenna that has 300-ohm twin flat leads, use an external antenna connector (300-75 ohm adaptor : not supplied) to connect the antenna to the HDD & DVD RECORDER.



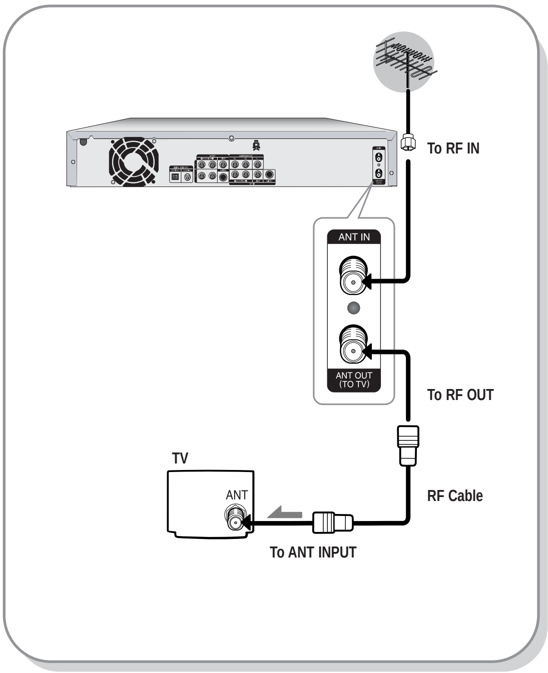
- If you have two separate antennas (one VHF and the other UHF), use a UHF/VHF combiner-adaptor (available at most electronics shops) to connect the antenna to the HDD & DVD RECORDER.



- The VHF/UHF RF OUT jack of this product sends only signals received through the antenna. It does not output Audio/ video signals. You must connect audio/video cables to view Video from the unit. (i.e. DVD playback)

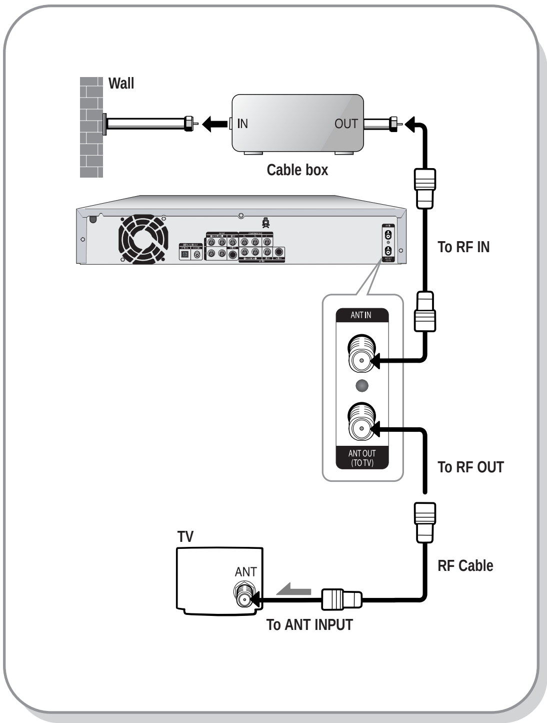
Method 1 : Antenna + HDD & DVD RECORDER + TV : No Cable box

You can record non-scrambled channels by selecting the channel on the HDD & DVD RECORDER. Also use this Method if you watch channels without cable box.



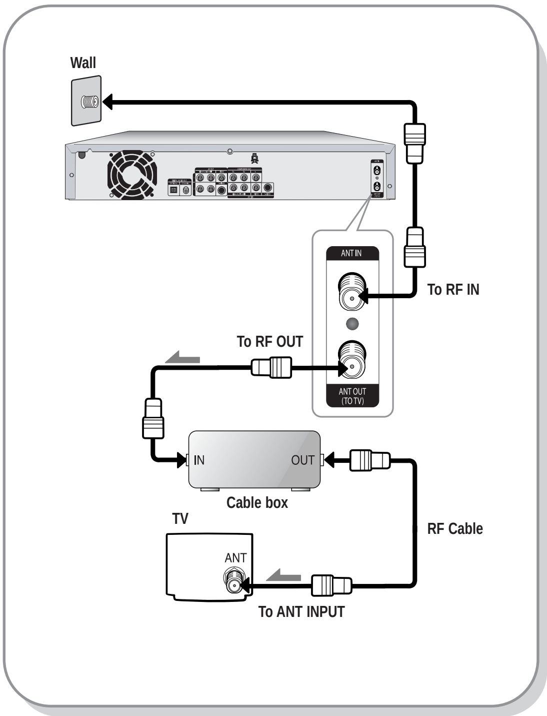
Method 2 : Antenna + Cable box + HDD & DVD RECORDER + TV : Cable box with many scrambled channels

You can record channels by selecting the channel on the cable box. You cannot record one channel while watching another channel. Be sure that the cable box is turned on.


Wall
IN
OUT
Cable box
To RF IN
ANT IN
ANT OUT (TO TV)
To RF OUT
TV
ANT
RF Cable
To ANT INPUT

Method 3 : Antenna + HDD & DVD RECORDER + Cable box + TV : Cable box with a few scrambled channels

You can record non-scrambled channels by selecting the channel on the cable box. You cannot record scrambled channels that require a cable box.


Wall
ANT IN
To RF IN
To RF OUT
ANT OUT (TO TV)
IN
OUT
Cable box
TV
ANT
RF Cable
To ANT INPUT

Step 2 : Connecting the Video cable

There are several ways to connect your HDD & DVD RECORDER. Select one of the following video connecting that best suits you below.

- Method 1 : Connecting to a Video input jack
- Method 2 : Connecting to an S-video input jack
- Method 3 : Connecting to Component video input jacks

S-Video, Component video and Progressive Output Modes

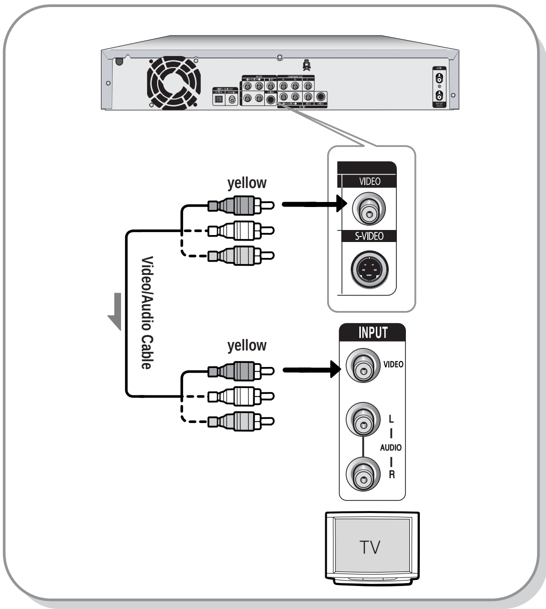
- S-Video and Component video output are available only if your TV supports S-Video input or Component video input, respectively. If S-Video or Component video output does not work, check the TV connections and the TV input selection settings. (For information on how to connect to a TV, see page 19.)
- Compared to standard interlaced video, progressive scan doubles the amount of video lines fed to your TV, resulting in a more stable, flicker-free, and clear image than interlaced video. The progressive scan video output jack is used in progressive output mode. This is only available with TVs that support progressive scan.
- Progressive Scan Output (480p)
  “Consumers should note that not all high definition television sets are fully compatible with this product and may cause artifacts to be displayed in the picture. If you experience 480p progressive scan picture problems, it is recommended that the user switch the connection to the ‘standard definition’ output. If there are questions regarding our TV set compatibility with this model, please contact our customer service center at 1-800-SAMSUNG.
- The VHF/UHF RF OUT jack of this product sends only signals received through the antenna. It does not output audio/video signals.

  You must use one of the following audio/video connections on this unit.

Method 1 : Connecting to a Video input jack

Connect a video(yellow) cable between the VIDEO(yellow) OUT jack on HDD & DVD RECORDER and VIDEO(yellow) IN jack on the TV (or AV amplifier).

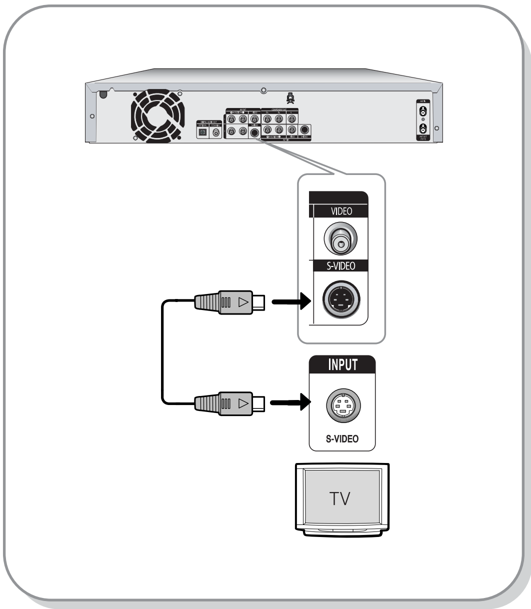
- You will enjoy regular quality images.
- Connect audio cables(white and red) between the AUDIO OUT jacks on the HDD & DVD RECORDER and AUDIO IN jacks on TV(or AV amplifier).
  (See pages 23~24)



Method 2 : Connecting to an S-Video input jack

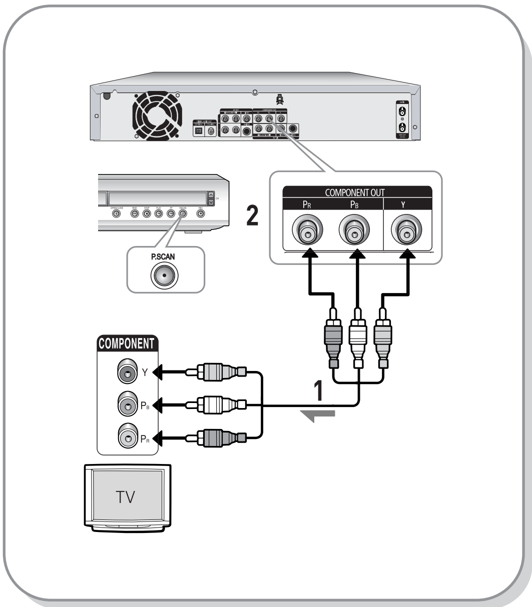
Connect an S-Video cable(not supplied) between the S-VIDEO OUT jack on HDD & DVD RECORDER and S-VIDEO IN jack on your TV (or AV amplifier).

- You will enjoy high quality images. S-Video separates the picture element into black and white (Y) and color (C) signals to present clearer images than regular video input mode.
- Connect audio cables(white and red) between the AUDIO OUT jacks on the HDD & DVD RECORDER and AUDIO IN jacks on TV(or AV amplifier). (See pages 23~24)



Method 3 : Connecting to Component video input jacks(Y,P_B,P_R)

1. Connect Component video cables(not supplied) between the COMPONENT OUT(Y,P_B,P_R) jacks on HDD & DVD RECORDER and COMPONENT IN(Y,P_B,P_R) jacks on your TV.
2. Connect audio cables (white and red) between the AUDIO OUT jacks on the HDD & DVD RECORDER and AUDIO IN jacks on TV (or AV amplifier). (See pages 23~24).
3. After connecting, refer to the page 40 to 42.
   - You will enjoy high quality and accurate color reproduction images.



NOTE

- Make sure that the color coded connections match. The Y, P_B, P_R component output jacks of your HDD & DVD RECORDER must be connected to the exact corresponding component input jacks on your TV.

Step 3 : Connecting the Audio cable

There are several ways to connect your HDD & DVD RECORDER. Select the audio connection that best suits you below.

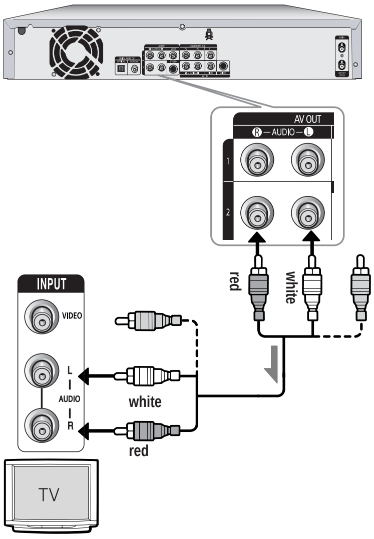
- Method 1 : Connecting to your TV
- Method 2 : Connecting to a stereo amplifier (analog audio out)
- Method 3 : Connecting to an AV amplifier with a digital input jack

Manufactured under license from Dolby Laboratories. “Dolby” and the double-D symbol are trademarks of Dolby Laboratories.

“DTS” and “DTS Digital Out” are trademarks of Digital Theater Systems, Inc.

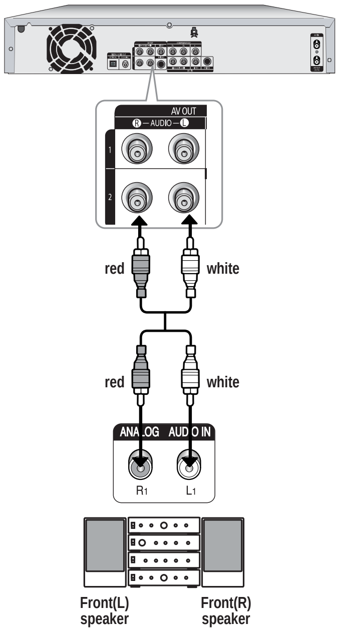
Method 1 : Connecting to your TV

This connection will use your TV’s speakers.


AV OUT
R — AUDIO — L
1
2
red
white
INPUT
VIDEO
L
AUDIO
R
white
red
TV

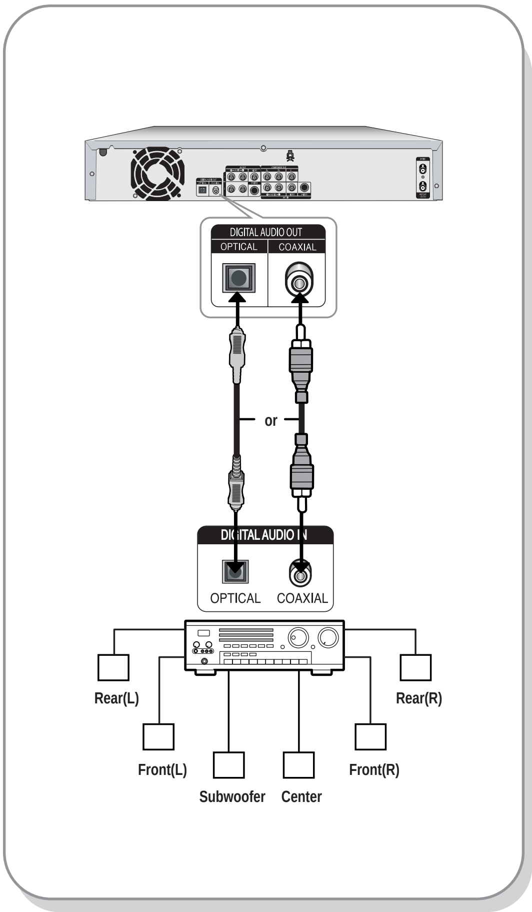
Method 2 : Connecting to a stereo amplifier with analog input jacks

If your stereo amplifier only has AUDIO INPUT jacks(L and R), use the AUDIO OUT jacks.


AV OUT
R — AUDIO — L
1
2
red
white
red
white
ANALOG AUDIO IN
R1
L1
Front(L) speaker
Front(R) speaker

Method 3: Connecting to an AV amplifier with a digital input jack

If your AV amplifier has a Dolby Digital or DTS decoder and a digital input jack, use this connection. To enjoy Dolby Digital or DTS sound, you will need to set up the audio settings. (See page 38)


DIGITAL AUDIO OUT
OPTICAL
COAXIAL
or
DIGITAL AUDIO IN
OPTICAL
COAXIAL
Rear(L)
Rear(R)
Front(L)
Front(R)
Subwoofer
Center

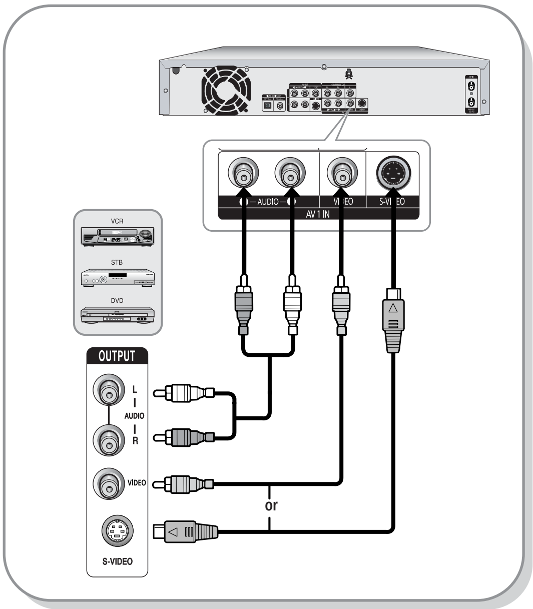
Step 4 : Connecting External devices

This allows you to connect your HDD & DVD RECORDER to other external devices and view or record their outputs.

- Method 1 : Connecting a VCR, Set-Top Box(STB) or HDD & DVD player to the AV 1 IN jacks
- Method 2 : Connecting a Camcorder to the AV 2 jacks
- Method 3 : Connecting a Camcorder to the DV IN jack

Method 1 : Connecting a VCR, Set-Top Box(STB) or HDD & DVD player to the AV 1 IN jacks

Connecting a VCR or external device to AUDIO/VIDEO AV 1 IN jacks of the HDD & DVD RECORDER. You can record from connected equipment (VCR, STB or DVD).


AUDIO
VIDEO
S-VIDEO
AV 1 IN
VCR
STB
DVD
OUTPUT
L
AUDIO
R
VIDEO
or
S-VIDEO

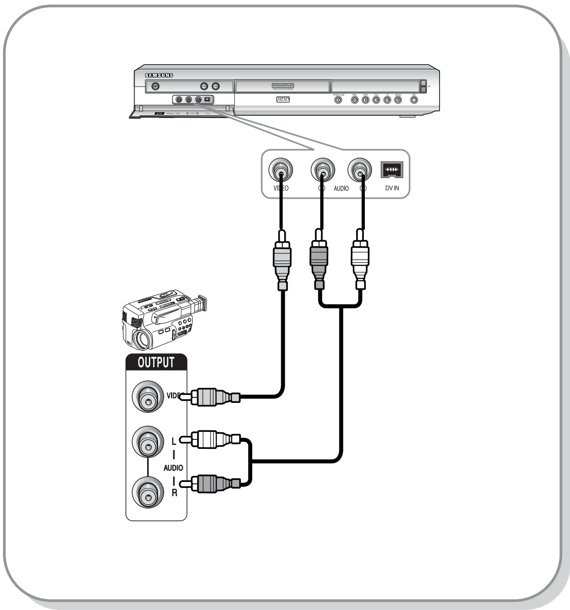
NOTE

- You can also use the AV 2 IN jacks on the front panel of the HDD & DVD RECORDER.
- When the S-Video jack and Video jack are both connected, the S-Video jack will have priority.
- Copy protected content cannot be recorded.

Method 2 : Connecting a Camcorder to the AV 2 IN jacks

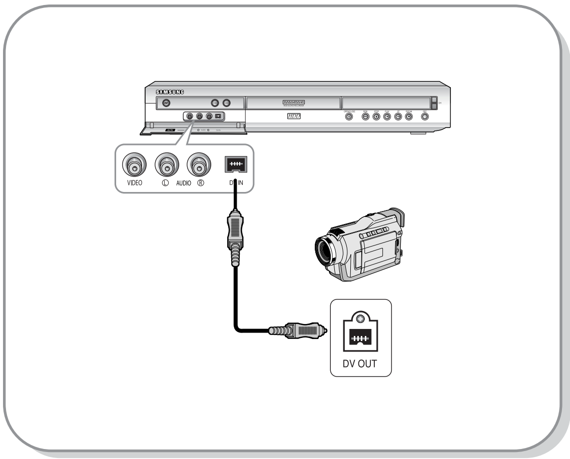
You can also use the AV 2 IN jacks on the front panel of the HDD & DVD RECORDER. You can record from connected equipment, such as a camcorder.

When an input source is inserted into AV 2 while viewing TV, the input will be switched to AV 2 automatically. If the input is not selected automatically, use **INPUT** button to select proper input.



Method 3 : Connecting a Camcorder to the DV IN jack

If your camcorder has a DV output jack, connect it to the DV input jack of your HDD & DVD RECORDER.

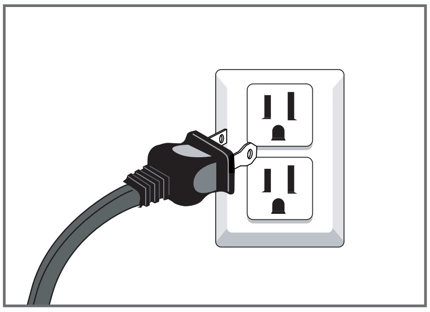


Step 5 : Connecting the Power Cord

After all connections are complete, plug the power cord in the wall outlet.

"Auto" appears in the panel display. This means that the current time is being set automatically (Auto Program) through the antenna under connection and also the channel is being set.
The setup may take a few minutes.

When the HDD & DVD RECORDER operates normally, the current time is automatically set and displayed in the front panel display.



NOTE

- After the current time is set automatically, the recorder will perform Auto Channel Memory for about 3 minutes. If power is on, while Auto Channel Memory is in process, Auto Channel Memory will stop. In this case, do Auto Channel Memory from MENU (See page 30).

System Setup

On-Screen Menu Navigation 26
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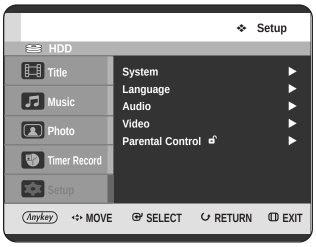
Manual Clock Set 29
Auto Channel Memory 30
Manual Channel Set 31
Auto Power Off Setting 32
CM Skip Time Setting 33
EP Mode Time Setting 34
Setting up the Front Display Options 35
Automatic Chapter Creator .36
Setting up the Language Options 37
Setting up the Audio Options 38
Setting up the Video display Options 40
Setting up the Progressive scan 41
Canceling the Progressive scan 42
Setting up the Parental Control 43

On-Screen Menu Navigation

The on-screen menus allow you to enable or disable various functions on your HDD & DVD RECORDER. Use the following buttons to open and navigate through the on-screen menus.



1 **MENU Button**
Press this button on the remote control to open the on-screen menu.
Press again to exit the on-screen menu.

2 **▲▼, ◀▶ Buttons**
Press these buttons on remote control to move the selection bar ▲▼, ◀▶ to cycle through the menu options.

3 **ENTER Button**
Press this button on the remote control to confirm any new settings.

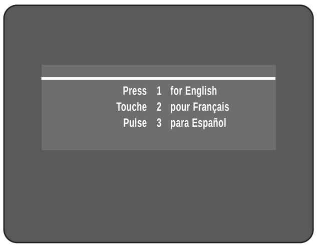
4 **RETURN Button**
Press this button on the remote control to return to the Previous menu screen displayed or to exit the on-screen menu.

OSD Language Setup

After plugging in the recorder, the first time you press the POWER button, this screen comes up.
(This screen will only appear when you plug in the recorder for the first time.)

1 Press the **DVD POWER** button.

2 Press a number button to select the language.



Press 1 for English
Touche 2 pour Français
Pulse 3 para Español

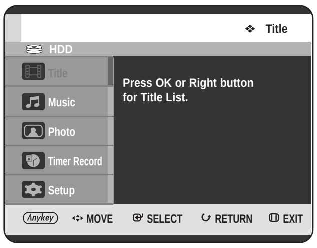
NOTE

- If the language for the startup screen is not set, the settings may change whenever you turn the power on or off. Therefore, make sure that you select the language you want to use.

Auto Clock Set

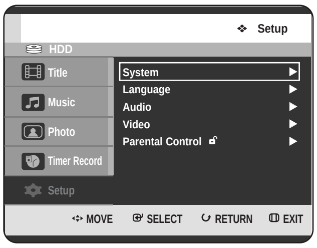
This menu is used to set the current time.
You need to set the time to use timer recording.

1 With the unit in Stop mode, press the **MENU** button.

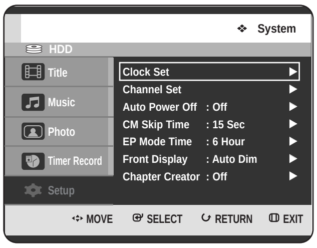

Title
HDD
Title
Music
Photo
Timer Record
Setup
Anykey
MOVE
SELECT
RETURN
EXIT

Press OK or Right button for Title List.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

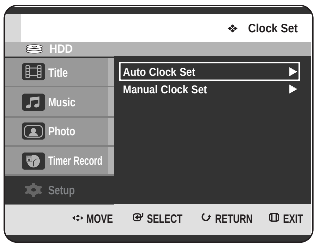

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
• System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

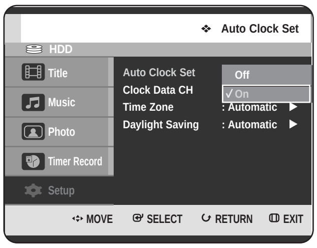
4 Press the ▲▼ buttons to select **Clock Set**, then press the **ENTER** or ▶ button.


Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
Auto Clock Set ▶
Manual Clock Set ▶
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Auto Clock Set**, then press the **ENTER** or ▶ button.

6 Press the ▲▼ buttons to select **Auto Clock Set**, then press the **ENTER** or ▶ button.

7 Press the ▲▼ buttons to select **On**, then press the **ENTER** or ▶ button.

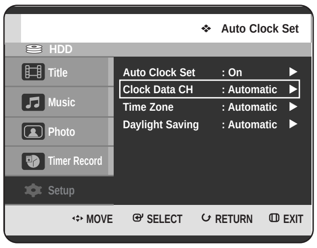

Auto Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
Off
√ On
MOVE
SELECT
RETURN
EXIT

Auto Clock Set
Clock Data CH
Time Zone : Automatic ▶
Daylight Saving : Automatic ▶

NOTE

- If your clock is set to the wrong time zone or daylight saving, you can adjust these settings without tuning off the Auto Clock Set function.

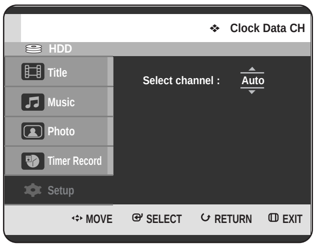
8 Select the sub menu(**Clock Data CH**, **Time Zone** or **Daylight Saving**) using the ▲▼ buttons, then press the **ENTER** or ▶ button.


Auto Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Auto Clock Set : On ▶
Clock Data CH : Automatic ▶
Time Zone : Automatic ▶
Daylight Saving : Automatic ▶

Clock Data CH

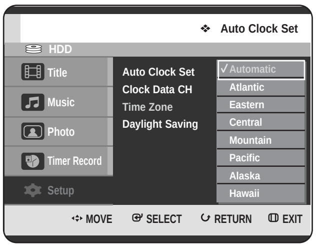
Select a channel that carries a time signal using the ▲▼ buttons then press the **ENTER** or ▶ button.
• Select **Auto** to set the clock data channel automatically.


Clock Data CH
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Select channel : Auto

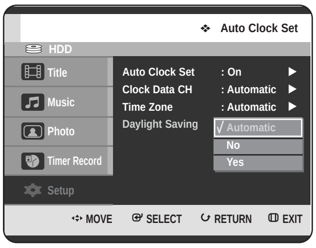
Time Zone

Select the time zone of your area using the ▲▼ buttons then press the **ENTER** or ▶ button.
• Select **Automatic** to set the time zone automatically.


Auto Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
Auto Clock Set
Clock Data CH
Time Zone
Daylight Saving
√ Automatic
Atlantic
Eastern
Central
Mountain
Pacific
Alaska
Hawaii
MOVE
SELECT
RETURN
EXIT

Daylight Saving

Select **Automatic**, **No** or **Yes** using the ▲▼ buttons then press the **ENTER** or ▶ button.
• Select **Automatic** to set the daylight saving automatically


Auto Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
√ Automatic
No
Yes
MOVE
SELECT
RETURN
EXIT

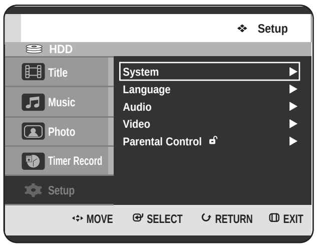
Auto Clock Set : On ▶
Clock Data CH : Automatic ▶
Time Zone : Automatic ▶
Daylight Saving

Manual Clock Set

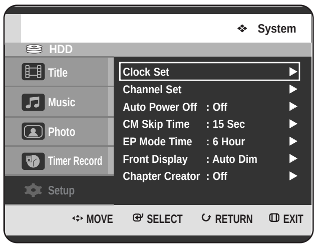
If your clock cannot be set automatically, set the clock manually.

1 With the unit in Stop mode, press the **MENU** button.

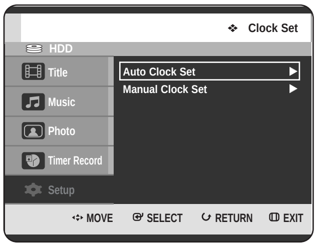
2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.


Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

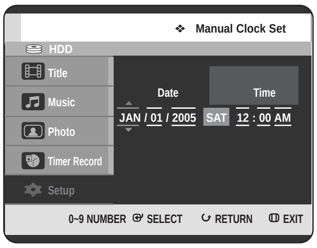
3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
• System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set ▶
Channel Set ▶
Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **Clock Set**, then press the **ENTER** or ▶ button.


Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
Auto Clock Set ▶
Manual Clock Set ▶
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Manual Clock Set**, then press the **ENTER** or ▶ button.


Manual Clock Set
HDD
Title
Music
Photo
Timer Record
Setup
Date: JAN / 01 / 2005 SAT
Time: 12 : 00 AM
0~9 NUMBER
SELECT
RETURN
EXIT

6 Using the ▲▼◀ ▶ buttons to select the Current Date and Current Time, and then press the **ENTER** button.
When the current time is stored in memory and then the set is powered off, the current time will appear in the front panel display.

▲▼ : Sets the value
You can set the value using the number buttons.

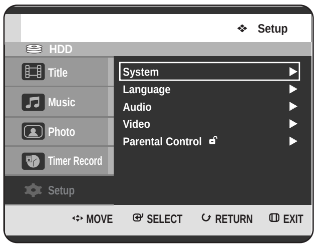
◀ ▶: Moves to items

Auto Channel Memory

You can set the Antenna/Cable TV settings automatically.

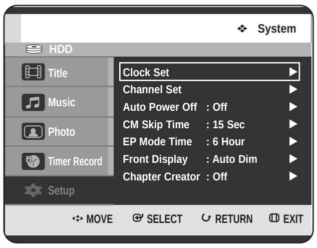
1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.


Setup
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

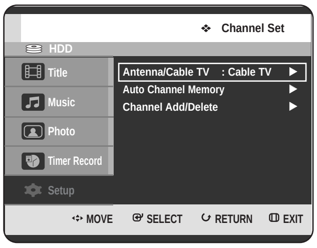
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
• System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

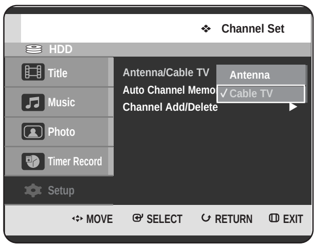
Clock Set ▶
Channel Set ▶
Auto Power Off : Off ▶
CM Skip Time : 15 Sec ▶
EP Mode Time : 6 Hour ▶
Front Display : Auto Dim ▶
Chapter Creator : Off ▶

4 Press the ▲▼ buttons to select **Channel Set**, then press the **ENTER** or ▶ button.


Channel Set
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Antenna/Cable TV : Cable TV ▶
Auto Channel Memory ▶
Channel Add/Delete ▶

5 Press the ▲▼ buttons to select **Antenna/Cable TV**, then press the **ENTER** or ▶ button.


Channel Set
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

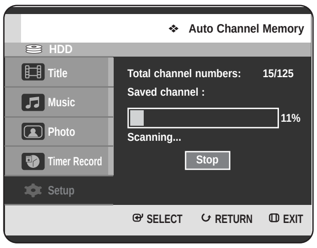
Antenna/Cable TV
Auto Channel Memo
Channel Add/Delete ▶

Antenna
√ Cable TV

Select the item that matches the antenna connection you selected on pages 19~20(Method 1, 2 and 3).

6 Select **Antenna** or **Cable TV**(depending on the hookup you chose) using the ▲▼ buttons, then press the **ENTER** or ▶ button.

7 Select **Auto Channel Memory** using the ▲▼ buttons, then press the **ENTER** or ▶ button.
Auto Channel Memory will be displayed.


Auto Channel Memory
HDD
Title
Music
Photo
Timer Record
Setup
Stop
SELECT
RETURN
EXIT

Total channel numbers: 15/125
Saved channel :
11%
Scanning...

NOTE

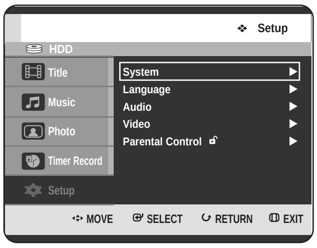
- Press the **RETURN** or **ENTER** button to stop Auto Channel Memory.

Manual Channel Set

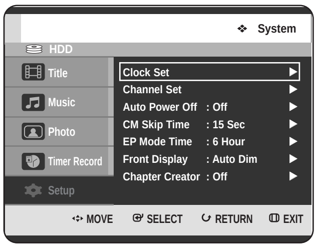
Manual Channel Set can be used after you have first selected Auto Channel Memory. Use the Manual Channel Setting to delete unnecessary channels after using the Auto Channel Memory.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

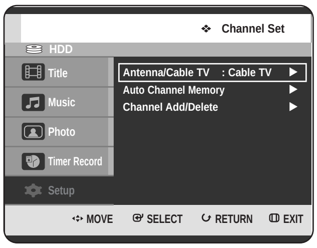

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
- System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

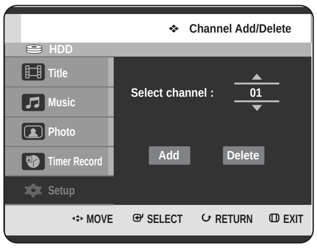
Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

4 Press the ▲▼ buttons to select **Channel Set**, then press the **ENTER** or ▶ button.


Channel Set
HDD
Title
Music
Photo
Timer Record
Setup
Auto Channel Memory
Channel Add/Delete
MOVE
SELECT
RETURN
EXIT

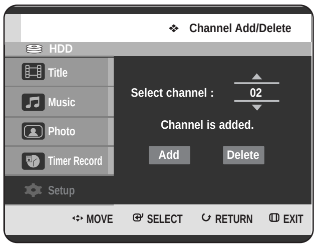
Antenna/Cable TV : Cable TV

5 Press the ▲▼ buttons to select **Channel Add/Delete**, then press the **ENTER** or ▶ button.


Channel Add/Delete
HDD
Title
Music
Photo
Timer Record
Setup
Add
Delete
MOVE
SELECT
RETURN
EXIT

Select channel : 01

6 Press the ▲▼ or number buttons to select the channels you want to add or delete on the **Select channel** screen. Then, press the **ENTER** button.


Channel Add/Delete
HDD
Title
Music
Photo
Timer Record
Setup
Add
Delete
MOVE
SELECT
RETURN
EXIT

Select channel : 02

Channel is added.

- Using ▲▼ buttons for channel selection allows the user to add/delete one channel at a time.
- Using **CH (⌃ ⌄)** buttons for channel selection jumps to the next channel memorized in Auto Channel Memory.

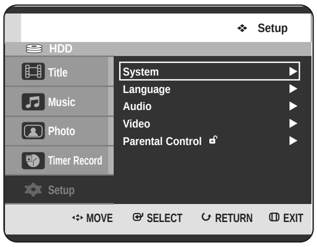
7 Press the ◀ ▶ buttons to select **Add** or **Delete**, then press the **ENTER** button.
- The message “Channel is added.” or “Channel is deleted.” will be displayed in the center of the screen.
- Continue to add or delete as many channels as you want to memorize or delete. This can be used to add channels not stored automatically due to weak signal strength.
- Press the **RETURN** button to return to the previous menu. Press the **MENU** button to exit the menu.

Auto Power Off Setting

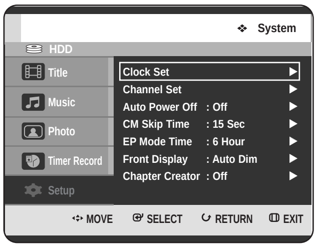
This feature automatically turns off your HDD & DVD RECORDER, if you do not press any button for the selected time.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

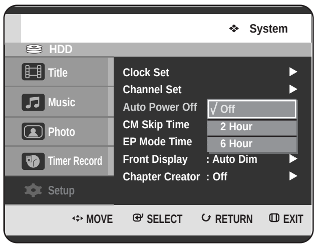

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button. System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set ▶
Channel Set ▶
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

4 Press the ▲▼ buttons to select **Auto Power Off**, then press the **ENTER** or ▶ button.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set ▶
Channel Set ▶
Auto Power Off
√ Off
2 Hour
6 Hour
CM Skip Time
EP Mode Time
MOVE
SELECT
RETURN
EXIT

Front Display : Auto Dim
Chapter Creator : Off

5 Press the ▲▼ buttons to select the desired item, then press the **ENTER** or ▶ button.

- **Off** : Auto power off is disabled.
- **2 Hour** : HDD & DVD RECORDER will automatically turns off for 2 hours after the last button is pressed.
- **6 Hour** : HDD & DVD RECORDER will automatically turns off for 6 hours after the last button is pressed.

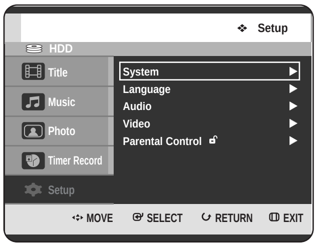
If turn off time set by automatic Power off function is reached during a playback or recording, the device will operate until the playback or recording is over.

CM Skip Time Setting

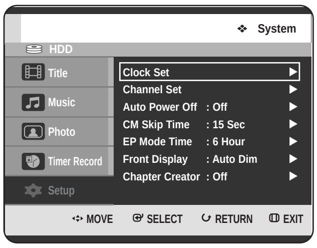
When a program recorded on a HDD, a DVD-RAM, a DVD-RW, or a DVD-R is played, the unit can be set to automatically skip a portion of the program corresponding to a CM(commercial) skip time set by the user.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

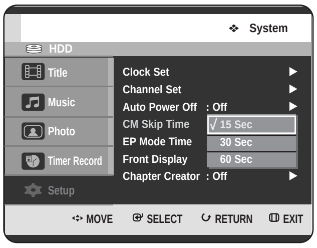

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

4 Press the ▲▼ buttons to select **CM Skip Time**, then press the **ENTER** or ▶ button.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
EP Mode Time
Front Display
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time
√ 15 Sec
30 Sec
60 Sec
Chapter Creator : Off

5 Press the ▲▼ buttons to select the desired time interval, then press the **ENTER** or ▶ button.

6 If you press the **CM SKIP** button during playback, the section corresponding to the set time is skipped, and then the next section is played.

NOTE

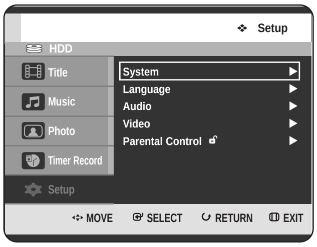
- CM Skip can be performed only during normal playback.
- When the time set is more than a remaining time of a current title: The next title is played from the beginning.
- When the time set is more than a remaining time of a play list, the next scene is played.
- CM Skip does not work in a still picture mode.
- When a set time is less than a remaining time of a scene, a last title, or a last track that is displayed currently, a prohibition mark appears.
- CM Skip releases Repeat (including Repeat A-B, Chapter, and Title).
- CM Skip may not operate with some DVD-Video discs.

EP Mode Time Setting

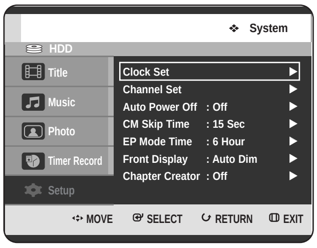
You can select one of four recording modes by pressing the **REC MODE** button repeatedly.
EP mode is one of four REC modes (XP, SP, LP, EP).
In EP(Extended Play) mode, you can set recording time to 6 or 8 hours by this setting.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.


Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

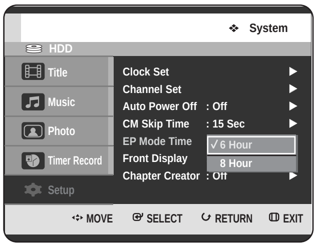
3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set ▶
Channel Set ▶

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **EP Mode Time**, then press the **ENTER** or ▶ button.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set ▶
Channel Set ▶

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time
√6 Hour
8 Hour
Front Display
Chapter Creator : Off

MOVE
SELECT
RETURN
EXIT

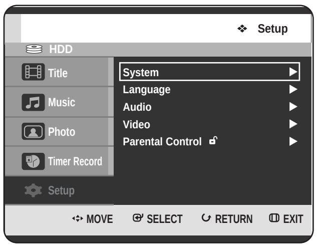
5 Press the ▲▼ buttons to select the desired time, then press the **ENTER** or ▶ button.

Setting up the Front Display Options

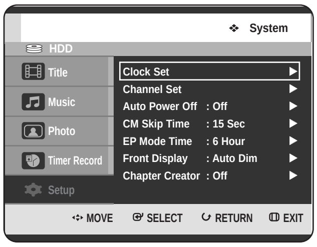
Adjust the brightness of the unit’s front panel display.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

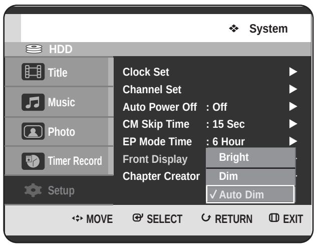

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
System menu will be displayed.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

4 Press the ▲▼ buttons to select **Front Display**, then press the **ENTER** or ▶ button.


System
HDD
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
Front Display
Chapter Creator
Bright
Dim
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
√ Auto Dim

5 Press the ▲▼ buttons to select the desired item, then press the **ENTER** or ▶ button.

- **Bright** : Makes the Front Panel Display bright.
- **Dim** : Makes the Front Panel Display dim.
- **Auto Dim** : Makes the Front Panel Display dim automatically when the set is in power off.

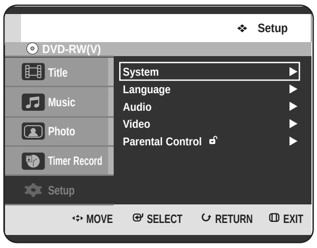
Automatic Chapter Creator

DVD-RW DVD-R

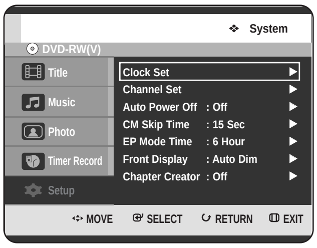
(V mode)

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

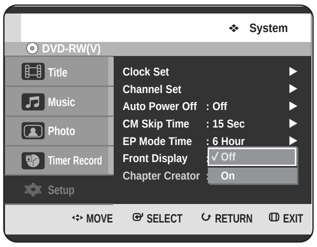

Setup
DVD-RW(V)
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **System**, then press the **ENTER** or ▶ button.
System menu will be displayed.


System
DVD-RW(V)
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display : Auto Dim
Chapter Creator : Off

4 Press the ▲▼ buttons to select **Chapter Creator**, then press the **ENTER** or ▶ button.


System
DVD-RW(V)
Title
Music
Photo
Timer Record
Setup
Clock Set
Channel Set
MOVE
SELECT
RETURN
EXIT

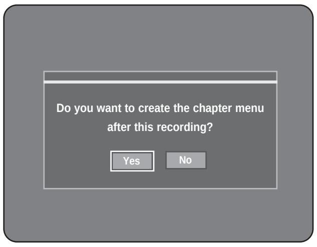
Auto Power Off : Off
CM Skip Time : 15 Sec
EP Mode Time : 6 Hour
Front Display
Chapter Creator : √ Off / On

5 Press the ▲▼ buttons to select the desired item, then press the **ENTER** or ▶ button.

- **Off:** Select this option when you do not want Automatic Chapter Creation.
- **On:** Select this option when you want Automatic Chapter Creation.

Press the **MENU** button to exit the menu.

6 Press the **REC** button to start recording. (See page 77 about how to set recording speed) The message “Do you want to create the chapter menu after this recording?” is displayed.

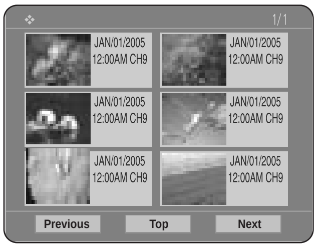

Do you want to create the chapter menu after this recording?

7 Press the ◀ ▶ buttons to select **Yes** and press the **ENTER** button.

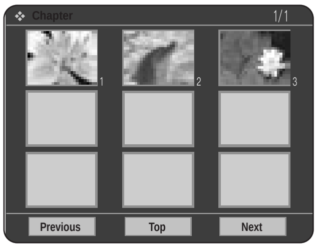
- A new chapter is created according to the selected recording mode. A chapter will be about 5 minutes long in XP and SP, and about 15 minutes long in LP and EP mode.

8 Press the **STOP** button to stop recording

9 To display the created titles, finalize the disc (See page 121) and then press the **TITLE MENU** button. Title menu will be displayed.


1/1
JAN/01/2005 12:00AM CH9
JAN/01/2005 12:00AM CH9
JAN/01/2005 12:00AM CH9
JAN/01/2005 12:00AM CH9
JAN/01/2005 12:00AM CH9
JAN/01/2005 12:00AM CH9
Previous
Top
Next

10 To display the created chapters, select the desired Title and then press the **DISC MENU** button. The chapter menu for the selected Title will be displayed.


Chapter
1/1
1
2
3
Previous
Top
Next

Caution

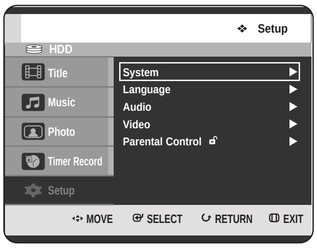
- The Automatic Chapter Creator function does not work during Timer Recording or when you turn the power off.

Setting up the Language Options

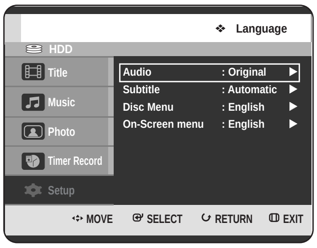
If you set the On-Screen menu, disc menu, audio and subtitle language in advance, they will come up automatically every time you watch a movie.
If the selected language is not recorded on the disc, the original pre-recorded language is selected.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

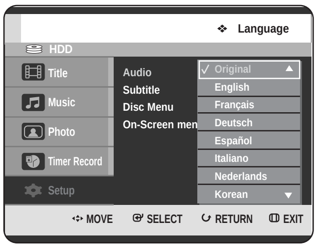

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Language**, then press the **ENTER** or ▶ button.
Language setup menu will be displayed.


Language
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Audio : Original ▶
Subtitle : Automatic ▶
Disc Menu : English ▶
On-Screen menu : English ▶

4 Press the ▲▼ buttons to select the desired language option, press the **ENTER** or ▶ button.


Language
HDD
Title
Music
Photo
Timer Record
Setup
Audio
Subtitle
Disc Menu
On-Screen men
✓ Original
English
Français
Deutsch
Español
Italiano
Nederlands
Korean
MOVE
SELECT
RETURN
EXIT

- **Audio** : For the disc audio language.
- **Subtitle** : For the disc subtitles.
- **Disc Menu**: For the disc menu contained on the disc
- **On-Screen Menu**: For the on-screen menu of your HDD & DVD RECORDER.

5 Press the ▲▼ buttons to select the desired language, then press the **ENTER** or ▶ button.

NOTE

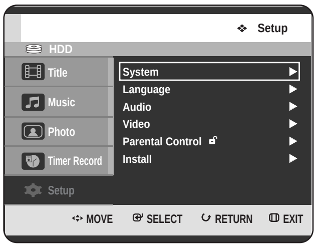
- Press the **RETURN** or ◀ button to return to the previous menu. Press the **MENU** button to exit the menu.
- The selected language will only appear if it is supported on the disc.

Setting up the Audio Options

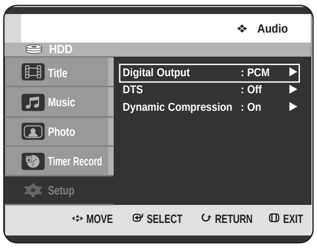
You can connect the HDD & DVD RECORDER to an external amp or Home theater.
Allow you to setup the Audio device and sound status depending on the audio system in use.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.


Setup
HDD
Title
Music
Photo
Timer Record
Setup
System
Language
Audio
Video
Parental Control
Install
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Audio**, then press the **ENTER** or ▶ button.
Audio setup menu will be displayed.


Audio
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Digital Output : PCM
DTS : Off
Dynamic Compression : On

4 Press the ▲▼ buttons to select the desired audio option, then press the **ENTER** or ▶ button.

5 Press the ▲▼ buttons to select the desired item, then press the **ENTER** or ▶ button.

NOTE

- Press the **RETURN** or ◀ button to return to the previous menu.
  Press the **MENU** button to exit the menu.

Digital Output

1. PCM : Select this when you have no equipment that can decode Dolby Digital (or MPEG-2) signal. When you play Dolby Digital (or MPEG-2) sound track, the digital output are converted to PCM Stereo.
2. Bitstream : Output Dolby Digital (or MPEG-2) audio as bitstream. Select this when your AV receiver or AV amplifier have Dolby Digital (or MPEG-2) Decoder.

NOTE

- Digital output setting is equally applied to both Dolby Digital and MPEG-2 audio. LPCM sound track is always outputted as PCM. It has no relation with Digital Output setting.
- Be sure to select the correct Digital Output or you will hear no sound or loud noise.

DTS

1. Off : Doesn’t output DTS signal. Select this when your AV receiver or AV amplifier does not have DTS decoder.
2. On : Outputs DTS Bitstream via digital output when you play DTS track. Select this only when your AV receiver (or AV amplifier) have DTS decoder.

NOTE

- When DTS soundtrack is played, sound does not output from AV Audio Output.

Dynamic Compression

This is only active when a Dolby Digital signal is detected.

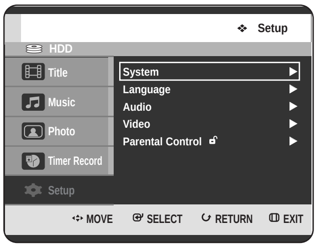
1. On : When Movie soundtracks are played at low volume or from smaller speakers, the system can apply appropriate compression to make low-level content more intelligible and prevent dramatic passages from getting too loud.
2. Off : You can enjoy the movie with the standard Dynamic Range.

Setting up the Video display Options

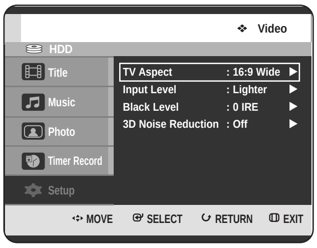
This function allows you to setup the TV screen settings. This function depends on disc type. It may not work for some disc types.

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

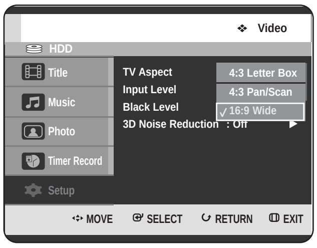

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Video**, then press the **ENTER** or ▶ button.
Video setup menu will be displayed.


Video
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

TV Aspect : 16:9 Wide ▶
Input Level : Lighter ▶
Black Level : 0 IRE ▶
3D Noise Reduction : Off ▶

4 Press the ▲▼ buttons to select the desired video option, then press the **ENTER** or ▶ button.


Video
HDD
Title
Music
Photo
Timer Record
Setup
4:3 Letter Box
4:3 Pan/Scan
✓ 16:9 Wide
MOVE
SELECT
RETURN
EXIT

TV Aspect
Input Level
Black Level
3D Noise Reduction : Off ▶

5 Press the ▲▼ buttons to select the desired item, then press the **ENTER** or ▶ button.

NOTE

- Press the **RETURN** or ◀ button to return to the previous menu.
  Press the **MENU** button to exit the menu.

TV Aspect

Depending on the type of television you have, you may want to adjust the screen setting. (aspect ratio)

1. 4:3 Letter Box : Select when you want to see the total 16:9 ratio screen DVD supplies, even though you have a TV with a 4:3 ratio screen. Black bars will appear at the top and bottom of the screen.
2. 4:3 Pan/Scan : Select this for conventional size TV when you want to see the central portion of the 16:9 screen. (Extreme left and right side of movie picture will be cut off.)
3. 16:9 Wide : You can view the full 16:9 picture on your widescreen TV.

Input Level

Adjusts the level of the input signal.

1. Darker : If you feel the screen is too light and you want to make the sceen darker.
2. Lighter : If you feel the screen is too dark and you want to make the sceen lighter.

Black Level

Adjusts the black level of the screen.

1. 0 IRE : This is the standard NTSC reference black level for consistent brightness/ contrast across all sources. Select this when you want darker screen.
2. 7.5 IRE : This will enhance the black level for increased brightness/contrast when viewing DVDs. Select this when you want lighter screen.

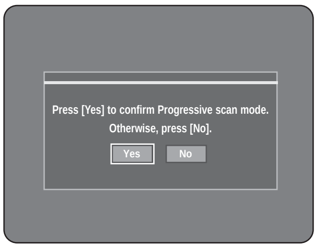
3D Noise Reduction (motion adaptive noise reduction)

1. Off : Normal
2. On : Provides a cleaner picture through noise reduction (for recording).

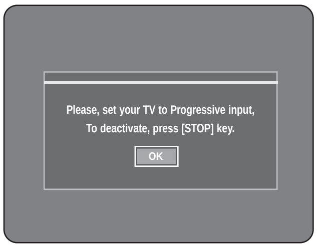
Setting up the Progressive scan

If the TV supports Progressive Scan, press the **P.SCAN** button on the front of the HDD & DVD RECORDER to enjoy.

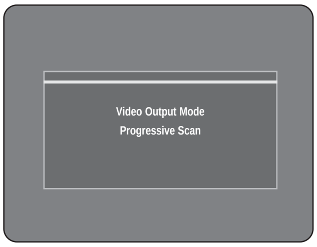
1 With the unit in Stop mode, press the **P.SCAN** button on the front of the HDD & DVD RECORDER.
The message “Press [Yes] to confirm Progressive scan mode. Otherwise, press [No].” will appear.
Press the ◀ ▶ buttons to select **Yes**, and then press the **ENTER** button.


Press [Yes] to confirm Progressive scan mode.
Otherwise, press [No].

2 The message “Please, set your TV to Progressive input. To deactivate, press [STOP] key.” will appear. Press the **ENTER** button.


Please, set your TV to Progressive input,
To deactivate, press [STOP] key.

3 The message “Video Output Mode Progressive Scan” will appear.

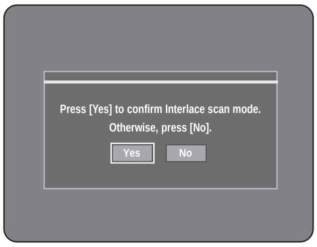

Video Output Mode
Progressive Scan

NOTE

- If the **P.SCAN** button on the HDD & DVD RECORDER’s front panel is pressed during playback, the message “This function is only available in stop mode” appears on the screen.
- Progressive setting is only available when the HDD & DVD RECORDER is in stop mode.

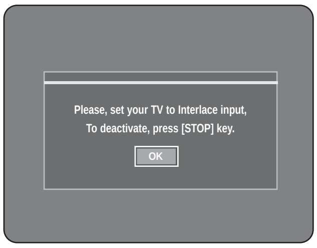
Canceling the Progressive scan

1 With the unit in Stop mode, press the **P.SCAN** button on the front of the HDD & DVD RECORDER.
The message “Press [Yes] to confirm Interlace scan mode. Otherwise, press [No].” will appear.
Press the ◀ ▶ buttons to select **Yes**, and then press the **ENTER** button.



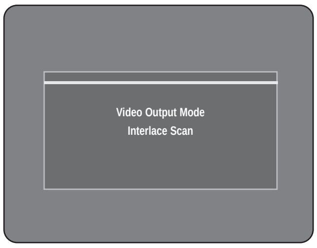
Press [Yes] to confirm Interlace scan mode.
Otherwise, press [No].

2 The message “Please, set your TV to Interlace input. To deactivate, press [STOP] key.” will appear. Press the **ENTER** button.



Please, set your TV to Interlace input,
To deactivate, press [STOP] key.

3 The message “Video Output Mode Interlace Scan” will appear.



Video Output Mode
Interlace Scan

NOTE

- Do not press the **P.SCAN** button if you are using a TV that does not support Progressive mode. Nothing will be displayed on the screen if pressed.
- If you press the **P.SCAN** button by mistake when your TV does not support Progressive mode, you need to release the Progressive mode. To release the Progressive mode, press the **P.SCAN** button on the front panel 3 times. The screen will recover after the PS ○ indicator on the front panel display turns off.

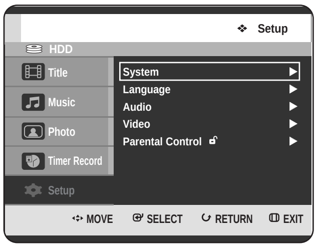
Setting up the Parental Control

The Parental Control function works in conjunction with DVDs that have been assigned a rating which helps you control the types of DVDs that your family watches. There are up to 8 rating levels on a disc.

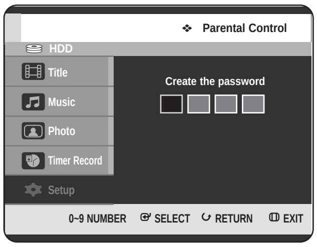
DVD-VIDEO

1 With the unit in Stop mode, press the **MENU** button.

2 Press the ▲▼ buttons to select **Setup**, then press the **ENTER** or ▶ button.

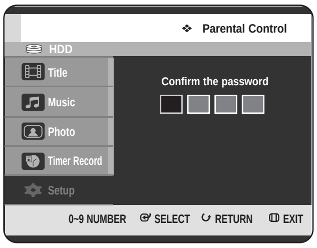

Setup
HDD
Title
Music
Photo
Timer Record
Setup
System ▶
Language ▶
Audio ▶
Video ▶
Parental Control ▶
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Parental Control**, then press the **ENTER** or ▶ button.


Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

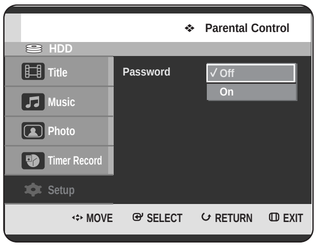
Create the password

4 Enter the 4-digit password using the number buttons on the remote control.
The “Confirm the password” message will be displayed. Enter your password again.


Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Confirm the password

5 Press the **ENTER** or ▶ button to select Password.


Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Password
✓ Off
On

6 Press the ▲▼ buttons to select **On** or **Off**, then press the **ENTER** or ▶ button.

NOTE

- Press the **RETURN** or ◀ button to return to the previous menu.
  Press the **MENU** button to exit the menu.

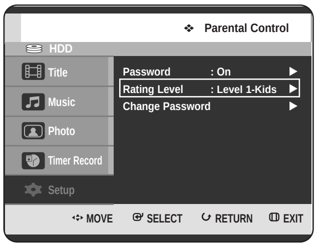
If you forgot your password

1 Remove the disc.

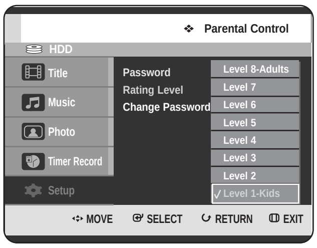
2 Press and hold the **PLAY (⏯) and STOP (■)** button on the front panel for 5 seconds or more.

About the Rating Level

1 Press the ▲▼ buttons to select **Rating Level**, then press the **ENTER** or ▶ button.


Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Password : On ▶
Rating Level : Level 1-Kids ▶
Change Password ▶

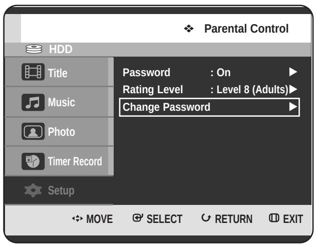

Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
Password
Rating Level
Change Password
Level 8-Adults
Level 7
Level 6
Level 5
Level 4
Level 3
Level 2
✓ Level 1-Kids
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select the rating level you want, then press the **ENTER** or ▶ button.

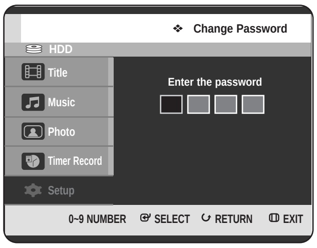
3 When you operate your HDD & DVD RECORDER for the first time, the "Create the Password" message will be displayed.
For example, if you select up to Level 6, discs that contain Level 7, 8 will not play. A larger number indicates that the program is intended for adult use only.

About the Change Password

1 Press the ▲▼ buttons to select **Change Password**, then press the **ENTER** or ▶ button.

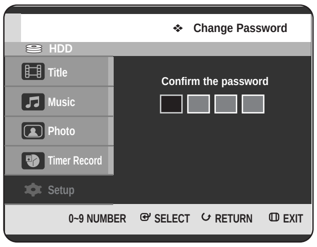

Parental Control
HDD
Title
Music
Photo
Timer Record
Setup
MOVE
SELECT
RETURN
EXIT

Password : On ▶
Rating Level : Level 8 (Adults) ▶
Change Password ▶


Change Password
HDD
Title
Music
Photo
Timer Record
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Enter the password

2 Enter the 4-digit password using the number buttons on the remote control.
The "Confirm the password" message will be displayed.


Change Password
HDD
Title
Music
Photo
Timer Record
Setup
0~9 NUMBER
SELECT
RETURN
EXIT

Confirm the password

3 Enter your password again using the number buttons on the remote control.

NOTE

- See page 43 if you forgot your password.

Playback

This section introduces basic functions of playback and playback by disc type.

DOLBY DIGITAL
Dolby Digital

dts
DTS

DIGITAL SOUND
Digital Audio

STEREO
Stereo

NTSC
NTSC broadcast system in U.S.A, Canada, Korea, Japan,etc.

MP3 DIGITAL DISC PLAYBACK
MP3

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Using the Search & Skip Functions....47
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Navigation Menu 52
Using the Markers....55
Using the Bookmarks....57
Selecting the Subtitle Language 59
Selecting the Soundtracks & Audio Channels 60
Changing the Camera Angle....61
Repeat Play....61
Zooming-In....63
Select Media....64
Playing an Audio CD/MP3....64
Playing a Picture 71

Before Playing

Read the following information before playing a disc.

Region code (DVD-Video only)

1
ALL

Both the HDD & DVD RECORDER and the discs are coded by region. These regional codes must match in order for the disc to play. If the codes do not match, the disc will not play. The Region Number for this HDD & DVD RECORDER is described on the rear panel of the HDD & DVD RECORDER.

Disc types that can be played

Disc Types	Disc Logo	Recorded content	Disc Shape	Max. Playing Time
DVD-VIDEO	DVD VIDEO	AUDIO + VIDEO	Single sided(5")	240
			Double sided(5")	480
			Single sided(3.5")	80
			Double sided(3.5")	160
VCD	COMPACT disc DIGITAL VIDEO	AUDIO + VIDEO	Single sided(5")	74
			Single sided(3.5")	20
AUDIO-CD	COMPACT disc DIGITAL AUDIO	AUDIO	Single sided(5")	74
			Single sided(3.5")	20
DVD-RAM	DVD RAM	AUDIO + VIDEO	Single-sided 5" (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
			Double-sided 5" (9.4GB)	2 (XP: Excellent Quality)
				4 (SP: Standard Quality)
				8 (LP: Long Playback)
				12 or 16 (EP:Extended)
DVD-RW	DVD RW	AUDIO + VIDEO	5" (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
DVD-R	DVD R	AUDIO + VIDEO	5" (4.7GB)	1 (XP: Excellent Quality)
				2 (SP: Standard Quality)
				4 (LP: Long Playback)
				6 or 8 (EP:Extended)
CD-RW/-R DVD-RAM/ -RW/-R		JPEG MP3	-	-
HDD	HDD	AUDIO + VIDEO		Approx. 28 (XP: Excellent Quality) Approx. 53 (SP: Standard Quality) Approx. 102 (LP: Long Playback) Approx.157 or Approx. 208 (EP:Extended)

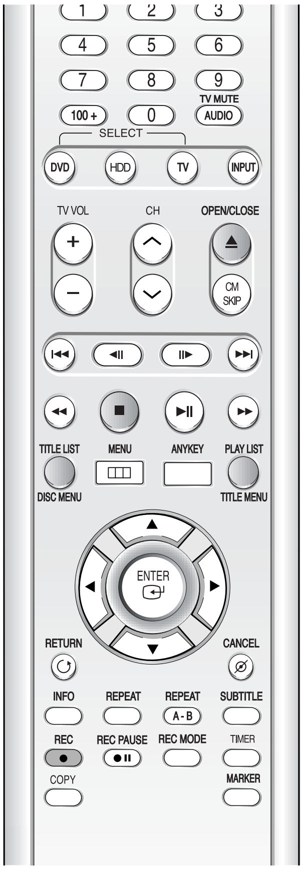
Discs that cannot be played

- DVD-Video with a region number other than "1" or "ALL"
- 12cm 2.6 GB and 5.2 GB DVD-RAM
- 3.9 GB DVD-R Disc for Authoring.
- DVD-RAM/-RW(VR mode) not recorded following the Video Recording Standard
- Unfinalized DVD-R,unfinalized DVD-RW(V mode) recorded on other equipment.
- PAL Disc
- DVD-ROM/DVD+RW/PD/MV-Disc/DiVX Video Disc, etc.
- CVD/SVCD/CD-ROM/CDV/CD-G/CD-I

NOTE

- This HDD & DVD RECORDER can only operate with discs that are compatible with DVD-RAM Standard Version 2.0.
- Playback and/or recording may not work for some types of discs, or when specific operations, such as angle change and aspect ratio adjustment, are being performed. Information about the discs is written in detail on the box. Please refer to this if necessary.
- Do not allow the disc to become dirty or scratched, finger prints, dirt, dust, scratches or deposits of cigarette smoke on the recording surface may make it impossible to use the disc for recording.
- DVD-RAM/-RW/-R discs may not be able to play on some DVD players, depending on the player, disc and the condition of the recording.
- Discs with PAL programs recorded on them cannot be recorded using this product.

Playing a Disc



1 Press the **OPEN/CLOSE** button.

2 Place a disc gently into the tray with the disc's label facing up.

3 Press **OPEN/CLOSE** button to close the disc tray.
- Your HDD & DVD RECORDER closes the disc tray and plays the disc automatically.
- The recorder does not play discs automatically after the initial power on.
- When the recorder is powered on and a disc is in the tray, the unit will be activated and wait in stop status.
- Press the **PLAY(⏯)** button to start playback.
- If you insert an MP3 Disc, your HDD & DVD RECORDER will display the file list on the screen and start playing.
- If you insert a JPEG Disc, folders and files are displayed in the thumbnail picture.
- If you want the unit to play automatically when it is powered on with a disc in the unit, power on with the **PLAY(⏯)** button.

4 Press the **STOP(■)** button to stop playback.

NOTE

- When you stop playing back a disc, the HDD & DVD RECORDER remembers where you stopped, so when you press **PLAY(⏯)** button again, it will pick up where you left off. (Unless the disc is removed or the HDD & DVD RECORDER is unplugged, or if you press the **STOP(■)** button twice.).

Caution

- Do not move your HDD & DVD RECORDER while playing, as this may cause damage to the disc.
- Make sure to press the **OPEN/CLOSE** button to open or close the disc tray.
- Do not push the disc tray while it is being opened or closed, as this may cause a product malfunction.
- Do not place foreign materials on or in the disc tray.
- Some functions may perform differently or be disabled depending on the disc type. If this occurs, refer to the instructions written on the disc case.
- Be especially careful that children's fingers are not caught between the disc tray and the tray chassis when it closes.
- You must only insert one DVD disc at a time. Inserting two or more discs will not allow playback and may cause damage to the DVD player.

Using the Disc Menu & Title Menu

Some type of discs contain a dedicated menu system that allows you to select special functions for title, chapter, audio track, subtitle, film preview, information on characters, etc.

Disc Menu

DVD-VIDEO VCD

1 Press the **DISC MENU** button to enter the disc menu of the disc.

- Move to the setup menu related to playback operation.
- You can select audio language and subtitle etc. provided by the disc.
- When playing a VCD2.0, you can choose Menu On or Menu Off by using the **DISC MENU** button.

Title Menu

DVD-VIDEO

1 Press the **TITLE MENU** button to move to the title menu of the disc.

- Press this button if the disc contains more than one title. Some discs may not support the title menu functionality.

For HDD/DVD-RAM/-RW/-R Disc

HDD DVD-RAM DVD-RW DVD-R

1 Press the **TITLE LIST** button to display title list.

NOTE

- Title List : Title List shows a list to help you select a title. Since the title list consists of the information on video stream that is actually recorded, if one title is deleted, that title cannot be played again.
- Play List : This refers to a unit of playback, which is made by selecting a desired scene in the entire Title List. When one playlist is played, only the scene selected by the user will play and then stop. Since only the information necessary for playing a desired scene is included in a playlist, even if that playlist is deleted, the original recording will not be deleted. (only VR mode)

Using the Search & Skip Functions

Searching through a Chapter or Track

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R CD VCD

1 During play, press the **SEARCH (⏪ ⏩)** buttons on the remote control.

HDD/ DVD-VIDEO/ DVD-RAM/-RW/-R	⏩ Fast X 2 → ⏩ Fast X 4 → ⏩ Fast X 8 → ⏩ Fast X 16 → ⏩ Fast X 32 → ⏩ Fast X 128
AUDIO CD (CD-DA)/VCD	⏩ X 2 → ⏩ X 4 → ⏩ X 8

- You can scan the program in reverse.
  To return to normal speed playback, press the **PLAY (⏯)** button.
- When you press and hold the **SEARCH (⏪ ⏩)** buttons, playback is done at the default speed of X4. If you release the **SEARCH (⏪ ⏩)** buttons, playback is performed at a normal speed.
- The speed marked in this function may be different from the actual playback speed.

NOTE

- No sound is heard during Scan(Search) mode, except CDs (CD-DA).

Skipping Chapters, a Tracks or Markers

During play, you can search quickly through a chapter or track.

1 During play, press the **SKIP (⏮ ⏭)** buttons on the remote control.

- **If you press the SKIP (⏮) button,** it moves to the beginning of the chapter or track or marker(HDD/DVD-RAM/-RW(VR mode)). Pressing the button once again within 3 seconds returns to the beginning of the previous chapter or track or marker(HDD/DVD-RAM/-RW(VR mode)).
- **If you press the SKIP (⏭) button,** it moves to the next chapter or track or marker (DVD-RAM/-RW(VR mode)).

Slow Motion Play/ Step Motion Play

Slow Motion Play

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

In pause or step mode, press the **SEARCH (⏪ ⏩)** buttons on the remote control.

- **If you press the SEARCH (⏩)button,**
  I▶ Slow 1/8 → I▶ Slow 1/4 → I▶ Slow 1/2
- **If you press the SEARCH (⏪) button,**
  ◀I Slow 1/8 → ◀I Slow 1/4 → ◀I Slow 1/2
- **To return to normal speed playback, press the PLAY (⏯) button.**

Press and hold the **SEARCH (⏪ ⏩)** buttons during pause, the disc will play slowly at a 1/4 speed. If the button is released, the pause operation will resume.

NOTE

- The speed marked in this function may be different from the actual playback speed.
- Slow motion play operates only in the forward direction on VCD discs.

Step Motion Play

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

Press the **STEP(◀II II▶)** buttons on the remote control in the pause mode.

- Each time the button is pressed, a new frame will appear.
  When the **STEP(◀II)** button is pressed, the previous frame will be activated.
  When the **STEP(II▶)** button is pressed, the next frame will be activated.
- To return to normal speed playback, press the **PLAY** **(▶II)** button.

NOTE

- Step motion play operates only in the forward direction on VCD discs.

About ANYKEY

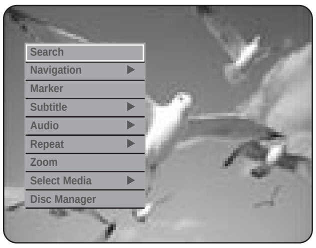
The ANYKEY function allows you to easily search for a desired scene by accessing title, chapter, track, time. You can also change the subtitle and audio settings and set some features including Marker, Angle, Zoom, Repeat, Select Media, Disc Manager.

Moving to a scene directly using the ANYKEY

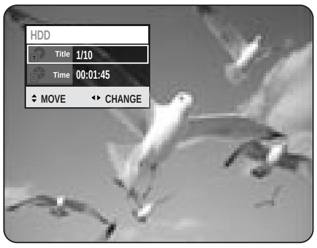
- If you want to move to a title, a chapter or a track to find a desired scene.

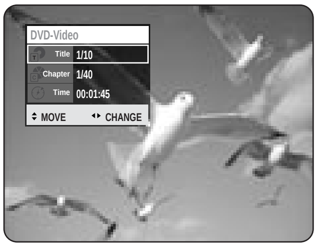
HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

1 Press the **ANYKEY** button during playback.



2 Press the ▲▼ buttons to select **Search**, then press the **ENTER** or ▶ button.


HDD
Title 1/10
Time 00:01:45

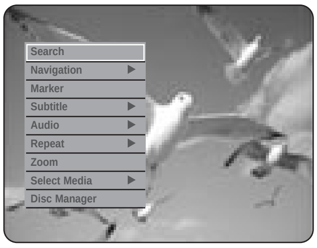

DVD-Video
Title 1/10
Chapter 1/40
Time 00:01:45

3 Press the ▲▼ buttons to select **Title**, **Chapter** or **Track**.

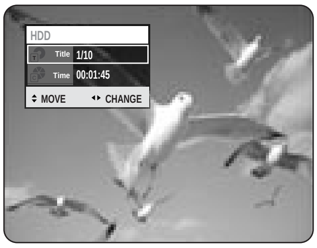
4 Press the ◀▶ buttons or number buttons to select the desired scene, then press the **ENTER** button.

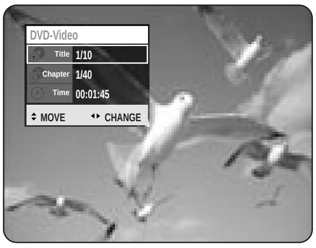
- If you want to move to a desired time following will help you find a scene.

1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Search**, then press the **ENTER** or ▶ button.


HDD
Title 1/10
Time 00:01:45
MOVE
CHANGE


DVD-Video
Title 1/10
Chapter 1/40
Time 00:01:45
MOVE
CHANGE

3 Press the ▲▼ buttons to select **Time.**

4 Enter the time in the sequence of hours, minutes, and seconds using the number buttons, then press the **ENTER** button.

NOTE

- This may not work for some discs. When an audio CD(CD-DA) or an MP3 disc is inserted, according to a disc type, the information display may not be appear.
- The Time Search function does not operate in some discs.
- To make the screen disappear, press the **ANYKEY** button again

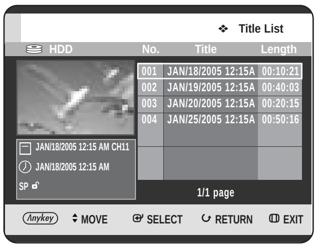
Playing the Title List

Follow these instructions to play back a scene from the Title List.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.



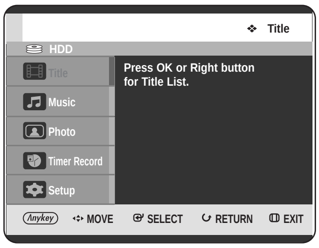
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

1/1 page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.



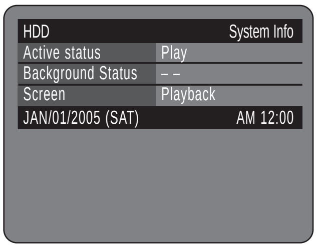
Press OK or Right button for Title List.

- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **ENTER** or **PLAY (⏯)** button.
The selected entry (title) will be played back.

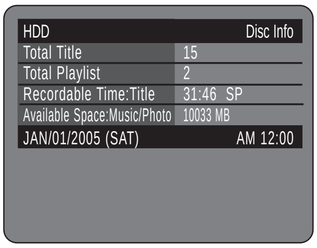
- About INFO button -

If you press the **INFO** button during a playback,
Pressing the **INFO** button once, the system information screen appears.: Displays Active Status, Background Status, and Main Screen information.



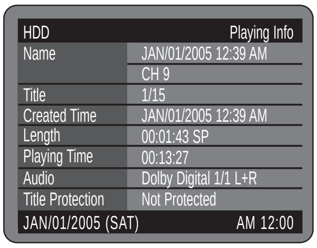
HDD	System Info
Active status	Play
Background Status	– –
Screen	Playback
JAN/01/2005 (SAT)	AM 12:00

Pressing the **INFO** button twice, Disc information screen appears.: Displays Total numbers of Titles and Playlists, Recordable Time(Title), Available Space(Music/Photo).



HDD	Disc Info
Total Title	15
Total Playlist	2
Recordable Time:Title	31:46 SP
Available Space:Music/Photo	10033 MB
JAN/01/2005 (SAT)	AM 12:00

Pressing the **INFO** button three times, Current playback information screen appears.: Displays information of Playback Name, Title, Created Time, Length, Playing Time, Audio, and if the disc protection is activated.



HDD	Playing Info
Name	JAN/01/2005 12:39 AM CH 9
Title	1/15
Created Time	JAN/01/2005 12:39 AM
Length	00:01:43 SP
Playing Time	00:13:27
Audio	Dolby Digital 1/1 L+R
Title Protection	Not Protected
JAN/01/2005 (SAT)	AM 12:00

3 To stop title play, press the **STOP(⊙)**button.
To return the title list screen, press the **TITLE LIST** button.

Navigation Menu

Scene Navigation

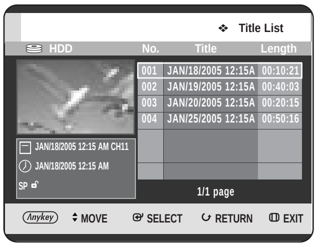
If there is a title composed of markers (see page 55), you can search the desired scene using the Scene Navigation.

HDD DVD-RAM DVD-RW

(VR mode)

Using the TITLE LIST button

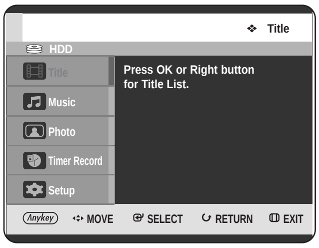
1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
No.
Title
Length
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

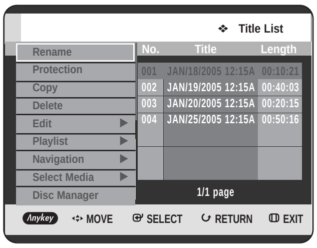
- With the unit in Stop mode/Playback mode, press the **MENU** button.


Title
HDD
Title
Music
Photo
Timer Record
Setup
Anykey
MOVE
SELECT
RETURN
EXIT

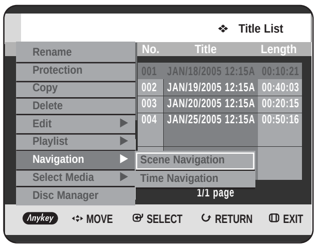
Press OK or Right button for Title List.

- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

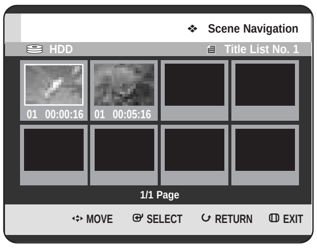
2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
No.
Title
Length
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Navigation**, then press the **ENTER** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Scene Navigation
Time Navigation
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **Scene Navigation**, then press the **ENTER** or ▶ button.

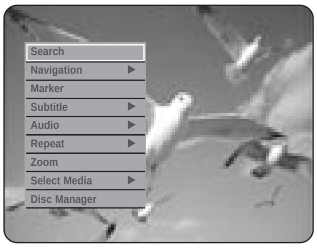

Scene Navigation
HDD
Title List No. 1
01 00:00:16
01 00:05:16
1/1 Page
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ ◀▶ buttons to select desired scene, then press the **ENTER** or **PLAY (** ⏯ **)** button.

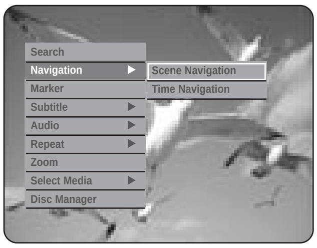
Playback

Using the ANYKEY button

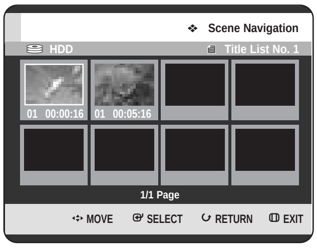
1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Navigation**, then press the **ENTER** or ▶ button.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
Scene Navigation
Time Navigation

3 Press the ▲▼ buttons to select **Scene Navigation**, then press the **ENTER** or ▶ button.


Scene Navigation
HDD
Title List No. 1
01 00:00:16
01 00:05:16
1/1 Page
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ ◀▶ buttons to select desired scene, then press the **ENTER** or **PLAY (⏯)** button.

NOTE

- Scene Navigation will not operate if a selected title does not have Markers.

Time Navigation

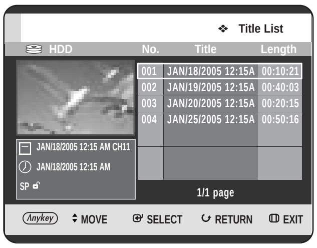
HDD DVD-RAM DVD-RW

(VR mode)

Using this function, you can search scene minute-by-minute from the recorded title list.

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.

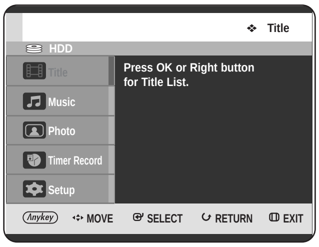

Title List
HDD
SP
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

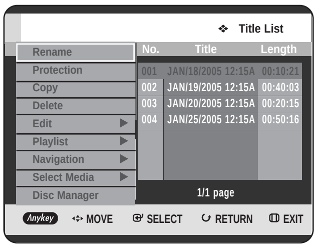
- With the unit in Stop mode/Playback mode, press the **MENU** button.


Title
HDD
Title
Music
Photo
Timer Record
Setup
Anykey
MOVE
SELECT
RETURN
EXIT

Press OK or Right button for Title List.

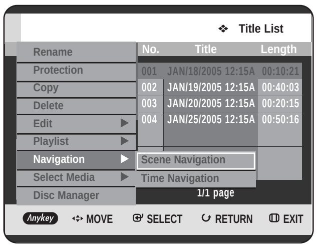
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select an entry you want to play from Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

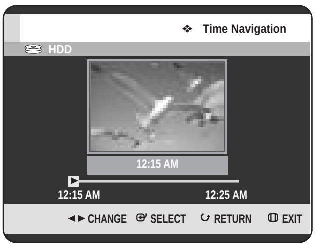
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Navigation**, then press the **ENTER** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Scene Navigation
Time Navigation
1/1 page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

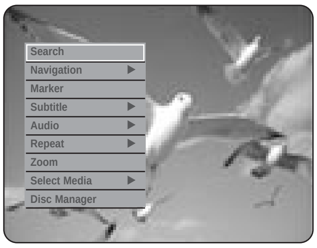
4 Press the ▲▼ buttons to select **Time Navigation**, then press the **ENTER** or ▶ button.


Time Navigation
HDD
12:15 AM
12:15 AM
12:25 AM
CHANGE
SELECT
RETURN
EXIT

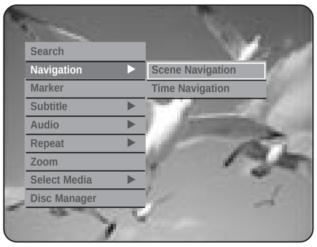
5 Press the ◀▶ buttons to skip one minute at a time and search the desired scene, then press the **ENTER** or **PLAY (**⏯**)** button.

Using the ANYKEY button

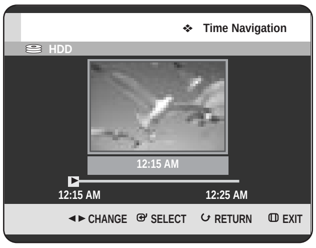
1 Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Navigation**, then press the **ENTER** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
Scene Navigation
Time Navigation

3 Press the ▲▼ buttons to select **Time Navigation**, then press the **ENTER** or ▶ button.


Time Navigation
HDD
12:15 AM
12:15 AM
12:25 AM
CHANGE
SELECT
RETURN
EXIT

4 Press the ◀▶ buttons to skip one minute at a time and search the desired scene, then press the **ENTER** or **PLAY (**⏯**)** button.

NOTE

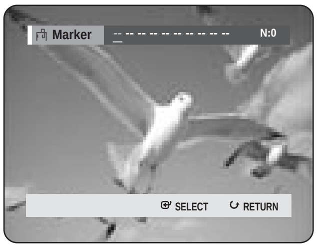
- Cursor does not move if selected recorded title is shorter than 1 minute.
- A disc that has not been recorded by this device may not operates Navigation function.
- An edited title may not display exact search time.

Using the Markers

HDD DVD-RAM DVD-RW
(VR mode)

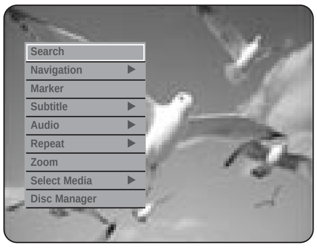
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
-- -- -- -- -- -- -- -- -- --
N:0
SELECT
RETURN

Using the ANYKEY button.

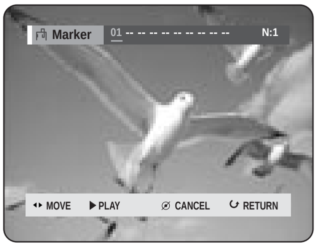
- Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

- Press the ▲▼ buttons to select **Marker**, then press the **ENTER** or ▶ button.

2 Press the **ENTER** button when the desired scene appears.

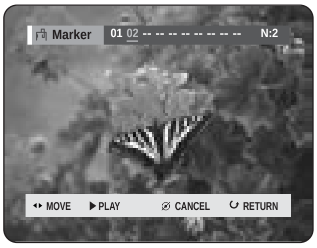
- The number **01** is displayed and the scene is memorized.


Marker
01 -- -- -- -- -- -- -- -- --
N:1
MOVE
PLAY
CANCEL
RETURN

3 Press the ◀ ▶ buttons to move to the next position.

4 Press the **ENTER** button again when the desired scene appears.

- The number **02** is displayed and the scene is memorized.

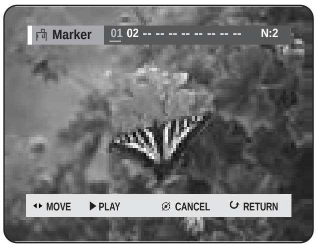

Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

- HDD, DVD-RAM or DVD-RW (VR Mode) discs have the Marker function instead of the Bookmark function. The Marker function allows you to mark up to 99 scenes. Since the scenes may be displayed as many different pages, numbering is necessary. If a disc in use is encoded with Disc Protection, Markers cannot be set or deleted. Only playback is available.

Playing back a marker

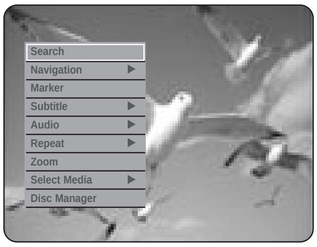
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

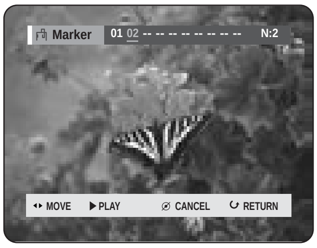
Using the ANYKEY button.

- Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

- Press the ▲▼ buttons to select **Marker**, then press the **ENTER** or ▶ button.

2 Press the ◀▶ buttons to select a marked scene.


Marker
01 02 -- -- -- -- -- -- -- --
N:2
MOVE
PLAY
CANCEL
RETURN

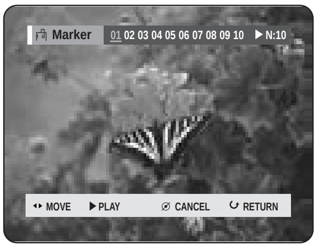
3 Press the **ENTER** or **PLAY** (⏯) button to start playing from the selected scene.

- If you press the **SKIP** (⏮) button, it moves to the beginning of the marker. Pressing the button once again within 3 seconds returns to the beginning of the previous marker.
- If you press the **SKIP** (⏭) button, it moves to the next marker.

Clearing a marker

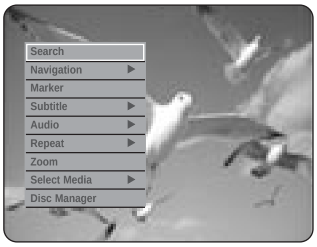
Using the MARKER button

1 Press the **MARKER** button during playback.


Marker
01 02 03 04 05 06 07 08 09 10
▶ N:10
MOVE
PLAY
CANCEL
RETURN

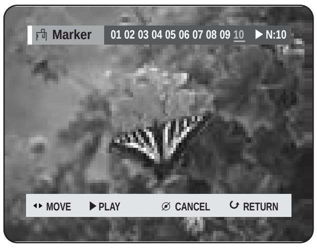
Using the ANYKEY button.

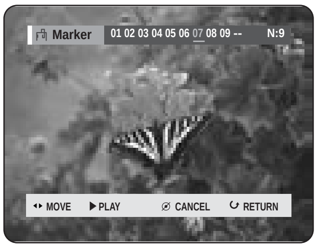
- Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

- Press the ▲▼ buttons to select **Marker**, then press the **ENTER** or ▶ button.

2 Press the ◀▶ buttons to select a marked scene. Press the **CANCEL** button to delete the selected mark.


Marker
01 02 03 04 05 06 07 08 09 10
▶ N:10
MOVE
PLAY
CANCEL
RETURN


Marker
01 02 03 04 05 06 07 08 09 --
N:9
MOVE
PLAY
CANCEL
RETURN

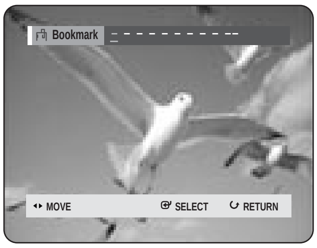
- When a marker is cleared while HDD/DVD-RAM/-RW (VR mode) is playing, marker numbers will change. For example, if the 7th marker is cleared after ten markers are registered, the marker numbers after the eighth will automatically move ahead by one and the 8th marker becomes the 7th.

Using the Bookmarks

DVD-VIDEO DVD-RW DVD-R VCD
(V-mode)

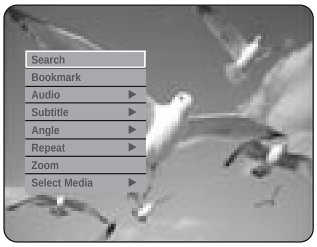
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark
MOVE
SELECT
RETURN

Using the ANYKEY button.

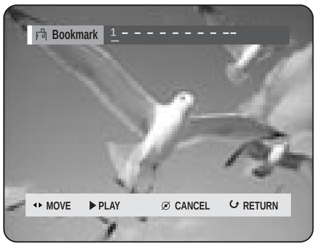
- Press the **ANYKEY** button during playback.


Search
Bookmark
Audio
Subtitle
Angle
Repeat
Zoom
Select Media

- Press the ▲▼ buttons to select **Bookmark**, then press the **ENTER** or ▶ button.

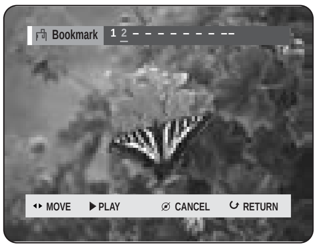
2 Press the **ENTER** button when the desired scene appears.

- The number 1 is displayed and the scene is memorized.


Bookmark
1
MOVE
PLAY
CANCEL
RETURN

3 Press the ◀ ▶ buttons to move to the next position.

4 Press the **ENTER** button again when the desired scene appears.
The number 2 is displayed and the scene is memorized.


Bookmark
1 2
MOVE
PLAY
CANCEL
RETURN

- Repeat above to bookmark other positions.
- You can bookmark up to 10 scenes.

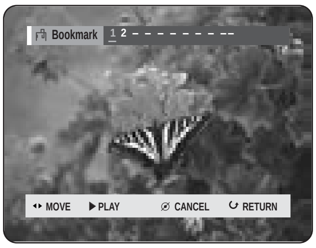
NOTE

- When the disc tray is opened and then closed, bookmarks will disappear.
- When VCD2.0 is in Menu Off mode only, this function works. (See page 47)

Playing back a bookmark

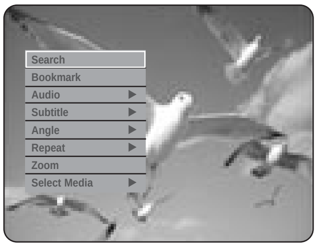
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark
1 2 – – – – – – – –
MOVE
PLAY
CANCEL
RETURN

Using the ANYKEY button.

- Press the **ANYKEY** button during playback.


Search
Bookmark
Audio
Subtitle
Angle
Repeat
Zoom
Select Media

- Press the ▲▼ buttons to select **Bookmark**, then press the **ENTER** or ▶ button.

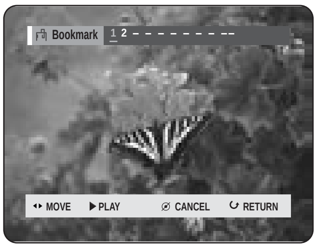
2 Press the ◀▶ buttons to select a bookmarked scene.

3 Press the **ENTER** or **PLAY(**⏯**)** button to start playing from the selected scene.

Clearing a bookmark

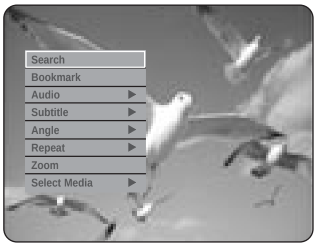
Using the MARKER button

1 Press the **MARKER** button during playback.


Bookmark
1 2 – – – – – – – –
MOVE
PLAY
CANCEL
RETURN

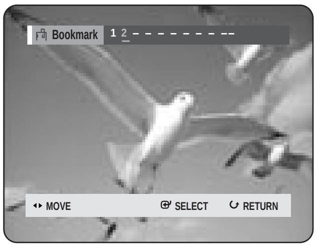
Using the ANYKEY button.

- Press the **ANYKEY** button during playback.


Search
Bookmark
Audio
Subtitle
Angle
Repeat
Zoom
Select Media

- Press the ▲▼ buttons to select **Bookmark**, then press the **ENTER** or ▶ button.

2 Press the ◀▶ buttons to select a bookmarked scene.


Bookmark
1 2 – – – – – – – –
MOVE
SELECT
RETURN

3 Press the **CANCEL** button to delete the selected bookmark.

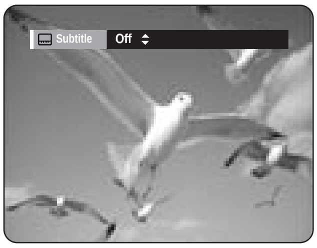
Selecting the Subtitle Language

Selects one of the subtitle language recorded on the disc.

HDD DVD-VIDEO DVD-RAM DVD-RW
(VR mode)

Using the SUBTITLE button

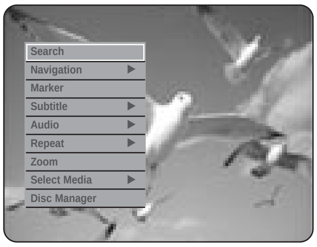
1 Press the **SUBTITLE** button during playback.


Subtitle
Off

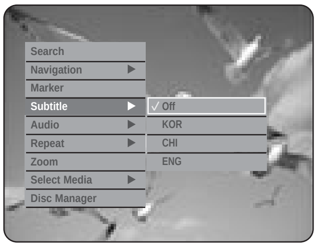
2 Press the ▲▼ buttons to select the desired subtitle language. Also, press the **SUBTITLE** button repeatedly to select the desired subtitle language.
- To make the screen disappear, press the **CANCEL** or **RETURN** button.

Using the ANYKEY button

1 Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Subtitle**, then press the **ENTER** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
√ Off
KOR
CHI
ENG

3 Press the ▲▼ buttons to select the desired subtitle language, then press the **ENTER** or ▶ button.

NOTE

- The subtitle display may be different depending on the disc type.
- Some discs allow you to select the language for the disc menu only.
- If the subtitle overlap, disable the caption function on your TV.

Selecting the Soundtracks & Audio Channels

Selecting the Audio

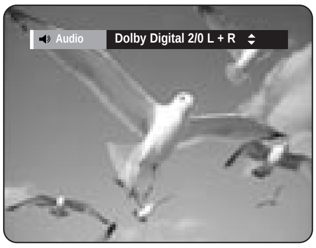
Selects one of the soundtracks recorded on the disc.
Also selects the audio channels.

HDD DVD-VIDEO DVD-RAM DVD-RW
(VR mode)

Using the AUDIO button

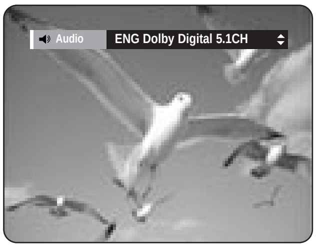
1 Press the **AUDIO** button during playback.

HDD/DVD-RAM/-RW



Audio: Dolby Digital 2/0 L + R

DVD-VIDEO

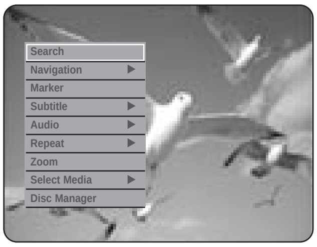


Audio: ENG Dolby Digital 5.1CH

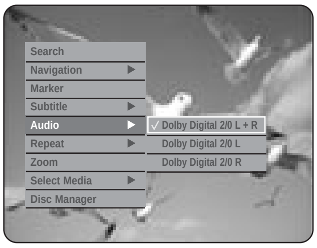
2 Press the ▲▼ buttons to select the desired soundtracks or audio channel. Also, press the **AUDIO** button repeatedly to select the desired soundtracks or audio channel.
- To make the screen disappear, then press the **CANCEL** or **RETURN** button.

Using the ANYKEY button

1 Press the **ANYKEY** button during playback.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager

2 Press the ▲▼ buttons to select **Audio**, then press the **ENTER** or ▶ button.


Search
Navigation
Marker
Subtitle
Audio
Repeat
Zoom
Select Media
Disc Manager
Dolby Digital 2/0 L
Dolby Digital 2/0 R

Audio: ✓ Dolby Digital 2/0 L + R

3 Press the ▲▼ buttons to select the desired soundtracks or audio channel, then press the **ENTER** or ▶ button.

NOTE

- Soundtracks or Audio channel may be different because they are disc-specific.
- Some discs allow you to select the audio language for the disc menu only.

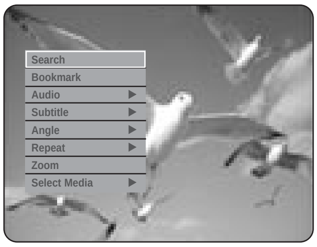
Changing the Camera Angle

When a HDD & DVD RECORDER contains multiple angles of a particular scene, you can select the Angle function.

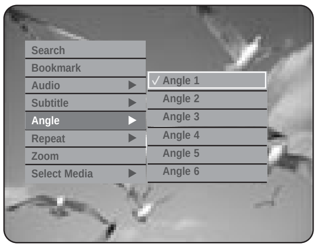
DVD-VIDEO

ANYKEY Using the ANYKEY button

1 Press the **ANYKEY** button during playback.


Search
Bookmark
Audio ▶
Subtitle ▶
Angle ▶
Repeat ▶
Zoom
Select Media ▶

2 Press the ▲▼ buttons to select **Angle**, then press the **ENTER** or ▶ button.


Search
Bookmark
Audio ▶
Subtitle ▶
Angle ▶
Repeat ▶
Zoom
Select Media ▶
√ Angle 1
Angle 2
Angle 3
Angle 4
Angle 5
Angle 6

3 Press the ▲▼ buttons to select the desired angle, then press the **ENTER** or ▶ button.

NOTE

- This function is disc-dependent, and may not work all DVDs.
- This function does not work when a DVD has not been recorded with a multi-camera angle system.

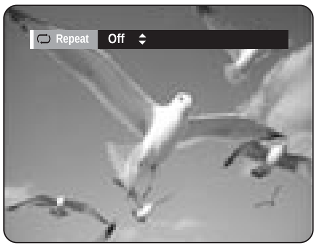
Repeat Play

Playing Repeatedly(Repeat Playback)

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

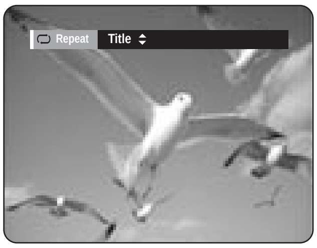
Using the REPEAT button

1 Press the **REPEAT** button during playback.



Repeat Off

2 Press the ▲▼ buttons to select the **Off**, **Title** or **Chapter** you want to play repeatedly, then press the **ENTER** button.
- To make the screen disappear, then press the **CANCEL** or **RETURN** button.



Repeat Title

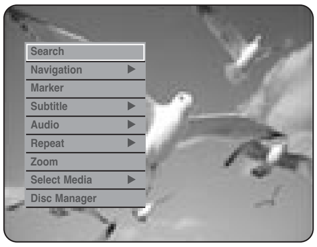
NOTE

- When VCD2.0 is in Menu Off mode only, this function works. (See page 47)

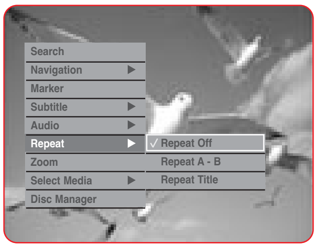
ANYKEY

Using the ANYKEY button

1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select the **Repeat**, then press the **ENTER** or ▶ button.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
✓ Repeat Off
Repeat A - B
Repeat Title

3 Press the ▲▼ buttons to select **Repeat Off**, **Repeat A-B**, **Repeat Title**, **Repeat Track** or **Repeat Chapter** you want to play repeatedly, then press the **ENTER** or ▶ button.

NOTE

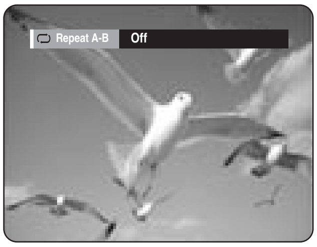
- HDD/DVD-RAM/-RW(VR mode), unfinalized DVD-R and unfinalized DVD-RW (V mode) do not repeat a chapter.

Repeat A-B

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

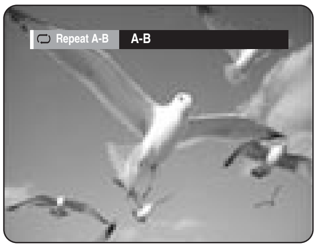
Using the REPEAT A-B button

1 Press the **REPEAT A-B** button during playback.



Repeat A-B Off

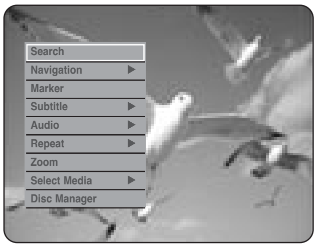
2 Press the **ENTER** button at the point where you want the repeat play to start (A) and press it again at the point where you want the repeat play to stop (B). Repeat playback of the A-B section starts.



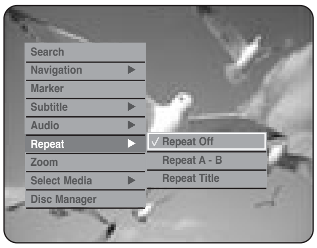
Repeat A-B A-B

ANYKEY Using the ANYKEY button

1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Repeat**, then press the **ENTER** or ▶ button.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
✓ Repeat Off
Repeat A - B
Repeat Title

3 Press the ▲▼ buttons to select **Repeat A-B**, then press the **ENTER** or ▶ button.

4 Press the **ENTER** button at the point where you want the repeat play to start (A) and press it again at the point where you want the repeat play to stop (B).Repeat playback of the A-B section starts.

- To return to normal playback -

5 Press the **CANCEL** button to return to normal playback.

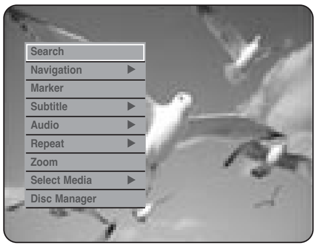
NOTE

- If you set point (B) before five seconds has lapsed, the prohibition mark (⊘) will appear.
- You can also activate Normal Playback by pressing the **CANCEL** button.
- Audio CDs(CD-DA) and MP3 discs do not support the Repeat A-B function.
- This function operates when VCD 2.0 is in the Menu Off mode only.

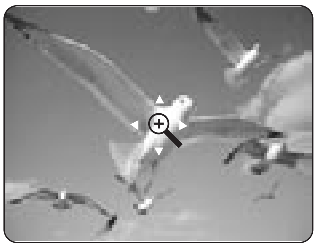
Zooming-In

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R VCD

1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Zoom**, then press the **ENTER** or ▶ button. (🔍) will be displayed.



3 Press ▲▼ ◀ ▶ buttons to move to the area you want to enlarge.

4 Press the **ENTER** button.
The screen will be enlarged to twice the normal size. The screen size will be enlarged to four times the normal size.

HDD/DVD-VIDEO/ DVD-RAM/-RW/-R	normal size → x2 → x4 → x2 → normal size
VCD	normal size → x2 → normal size

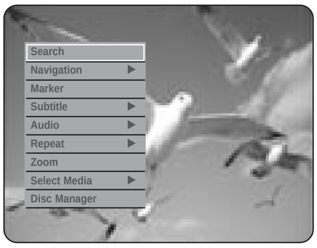
NOTE

- When recording is done in the EP mode, the Zoom function will not be supported except when the recording has been done in V mode.

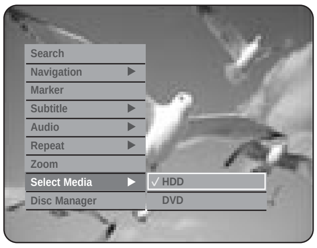
Select Media

HDD DVD-VIDEO DVD-RAM DVD-RW DVD-R

1 Press the **ANYKEY** button during playback.


Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager

2 Press the ▲▼ buttons to select **Select Media**, then press the **ENTER** or ▶ button.

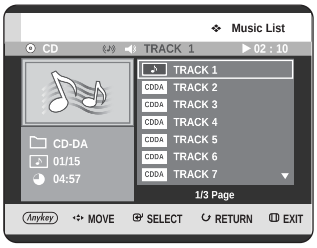

Search
Navigation ▶
Marker
Subtitle ▶
Audio ▶
Repeat ▶
Zoom
Select Media ▶
Disc Manager
✓ HDD
DVD

3 Press the ▲▼ buttons to select **HDD** or **DVD**, then press the **ENTER** or ▶ button.

Playing an Audio CD/MP3

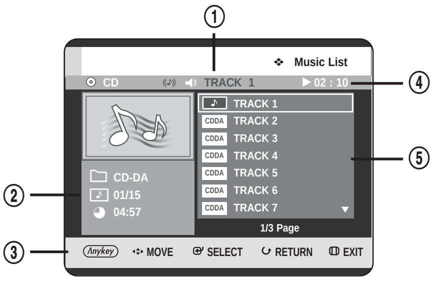
Playing an Audio CD(CD-DA)

1 Insert an audio CD (CD-DA) into the disc tray.
- The audio CD menu appears and the tracks (songs) are played automatically.


Music List
CD
TRACK 1
▶ 02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

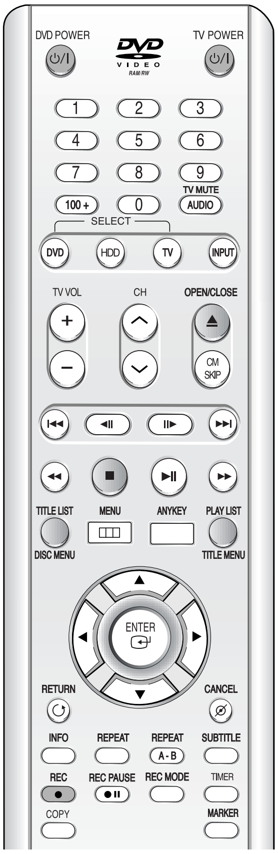
2 Press the ▲▼ buttons to select the track (song) you want to hear, and then press the **ENTER** button.

Audio CD(CD-DA) Screen Elements


①
②
③
④
⑤
Music List
CD
TRACK 1
▶ 02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

1. **Current track (song)**: Displays the number of the track currently being played.
2. Displays the current play index, total track number.
3. Display available buttons.
4. This shows the operating state of a disc and a playback time corresponding to a portion that is currently played.
5. Displays the track list (song list).

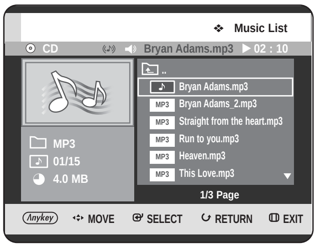
Buttons on the Remote Control used for Audio CD(CD-DA) playback


DVD POWER
TV POWER
DVD VIDEO RAM/RW
1
2
3
4
5
6
7
8
9
TV MUTE
100+
0
AUDIO
SELECT
DVD
HDD
TV
INPUT
TV VOL
CH
OPEN/CLOSE
CM SKIP
TITLE LIST
MENU
ANYKEY
PLAY LIST
DISC MENU
TITLE MENU
ENTER
RETURN
CANCEL
INFO
REPEAT
REPEAT A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER

1. **▲▼:** Selects a track (song).
2. **◀ ▶ :** Move the page up/down.
3. **ENTER button:** Plays the selected track (song).
4. **SKIP (⏭) button:** Plays the next track.
5. **SKIP (⏮) button:** Returns to the beginning of the current track when pressed during playback. If pressed again, your HDD & DVD RECORDER moves to and plays the previous track.
   If you press the this button within three seconds after playback starts, the previous track will be played.
   If you press the this button after three seconds, the current track will be replayed from the beginning.
6. **Press the SEARCH (⏪⏩) buttons:**
   Fast Play (X2, X4, X8)
7. **STOP (■) button:** Stops a track(song).
8. **PLAY (⏯) button:** Plays a track(song) or pauses playback.
9. **ANYKEY button**: The ANYKEY menu is displayed. (**Play Mode**, **Go To Playlist** or **New Playlist**).

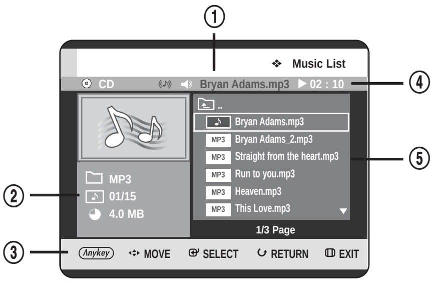
Playing an MP3 Disc

1 Insert an MP3 disc into the disc tray.
- The MP3 menu is displayed and the tracks (songs) are played automatically.


Music List
CD
Bryan Adams.mp3 ▶ 02 : 10
..
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select the track you want to hear, and then press the **ENTER** button.

MP3 Screen Elements

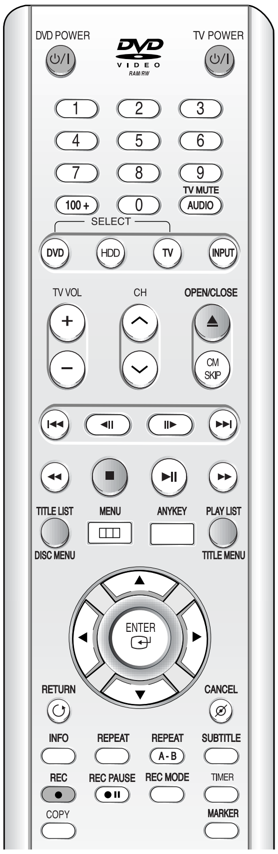

①
②
③
④
⑤
Music List
CD
Bryan Adams.mp3 ▶ 02 : 10
..
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

1. **Current track (song):** Displays the name of the track being played.
2. Displays the current folder, play index and current track size.
3. Display available buttons.
4. This shows the operating state of a disc and a playback time corresponding to a portion that is currently played.
5. Displays the information for the folder and its tracks.

NOTE

- If a disc contains only MP3 files or only JPEG files, the MP3 or JPEG screen appears after the disc is loaded.
- If a disc contains a mix of MP3 and JPEG files, you need to select Music for MP3 files or Photo for JPEG files.

Buttons on the Remote Control used for MP3 playback

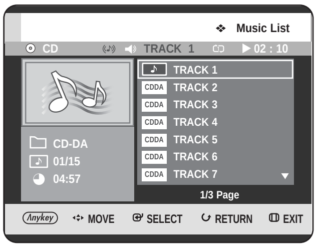

DVD POWER
TV POWER
DVD VIDEO RAM/RW
1
2
3
4
5
6
7
8
9
TV MUTE
100+
0
AUDIO
SELECT
DVD
HDD
TV
INPUT
TV VOL
CH
OPEN/CLOSE
CM SKIP
TITLE LIST
MENU
ANYKEY
PLAY LIST
DISC MENU
TITLE MENU
ENTER
RETURN
CANCEL
INFO
REPEAT
REPEAT A-B
SUBTITLE
REC
REC PAUSE
REC MODE
TIMER
COPY
MARKER

1. ▲▼: Selects a track (song).
2. ◀ ▶ : Move the page up/down.
3. **ENTER button:** Plays the selected track (song).
4. **SKIP (⏭) button:** Plays the next track.
5. **SKIP (⏮) button:** Returns to the beginning of the current track when pressed during playback. If pressed again, your HDD & DVD RECORDER moves to and plays the previous track.
   If you press the this button within three seconds after playback starts, the previous track will be played.
   If you press the this button after three seconds, the current track will be replayed from the beginning.
6. **STOP (⏹) button:** Stops a track(song).
7. **PLAY (⏯) button:** Plays a track(song) or pauses playback.
8. **ANYKEY button**: The ANYKEY menu is displayed. (**Copy**, **Play Mode**, **Go To Playlist**, **New Playlist** or **Select Media**).

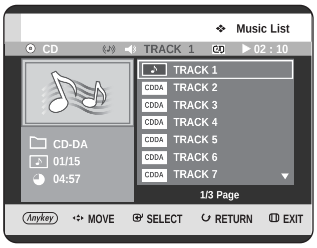
Repeat CD (CD-DA) & MP3

Using the REPEAT button.

1 Press the **REPEAT** button during playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the **REPEAT** button repeatedly to select the repeat mode you want.


Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

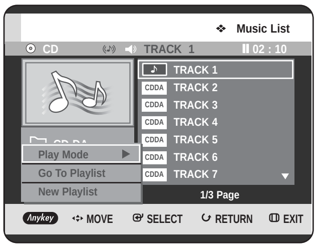
- **Repeat Track (CD (CD-DA)/MP3)**
- **Repeat Folder (MP3)**
- **Repeat All (CD (CD-DA)/MP3)**
- **Random (CD (CD-DA)/MP3):** The random option plays a disc's track in random order.
- **Normal (CD (CD-DA)/MP3):** Track on a disc are played in the order in which they were recorded on the disc.

- To return to normal playback -

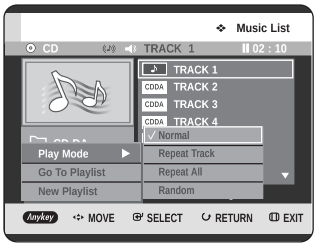
3 Press the **REPEAT** or **CANCEL** button repeatedly to return to normal playback.

Using the ANYKEY button.

1 Press the **ANYKEY** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Play Mode**, then press the **ENTER** or ▶ button.


Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
Play Mode
Go To Playlist
New Playlist
Normal
Repeat Track
Repeat All
Random
Anykey
MOVE
SELECT
RETURN
EXIT

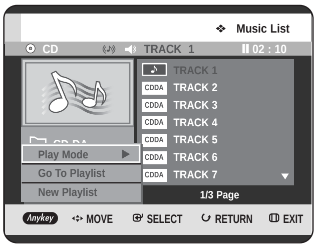
3 Press the ▲▼ buttons to select desired play mode, then press the **ENTER** or ▶ button.

- **Normal (CD (CD-DA)/MP3):** Track on a disc are played in the order in which they were recorded on the disc.
- **Repeat Track (CD (CD-DA)/MP3)**
- **Repeat Folder (MP3)**
- **Repeat All (CD (CD-DA)/MP3)**
- **Random (CD (CD-DA)/MP3):** The random option plays a disc's track in random order.

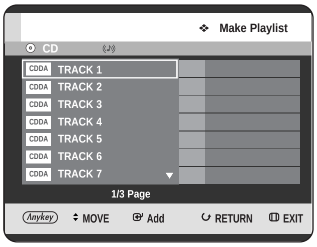
New Playlist

You can register a maximum 28 tracks in the playlist.

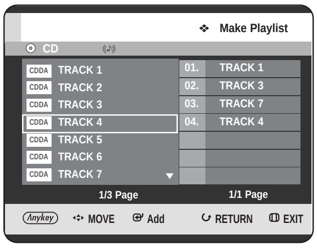
1 Press the **ANYKEY** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

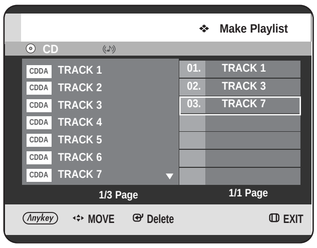
2 Press the ▲▼ buttons to select **New Playlist**, then press the **ENTER** or ▶ button.


Make Playlist
CD
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
1/3 Page
Anykey
MOVE
Add
RETURN
EXIT

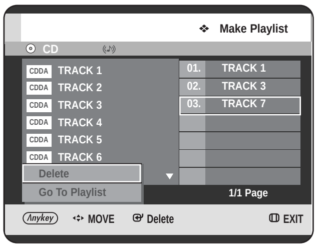
3 Press the ▲▼ buttons to select tracks in order in which you want them to play, then press the **ENTER** button.


Make Playlist
CD
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
01. TRACK 1
02. TRACK 3
03. TRACK 7
04. TRACK 4
1/3 Page
1/1 Page
Anykey
MOVE
Add
RETURN
EXIT

4 If you playlisted a wrong track, press the ►▲▼ buttons to select wrong track, then press the **ENTER** or **CANCEL** button. The wrong track will be removed.


Make Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
01. TRACK 1
02. TRACK 3
03. TRACK 7
1/3 Page
1/1 Page
Anykey
MOVE
Delete
EXIT

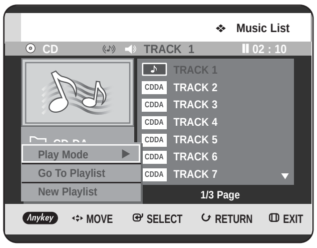
5 To store the playlist, press the **ANYKEY** button.


Make Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
Delete
Go To Playlist
01. TRACK 1
02. TRACK 3
03. TRACK 7
1/1 Page
Anykey
MOVE
Delete
EXIT

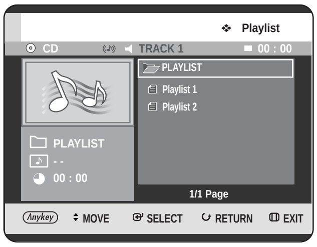
6. Press the ▲▼ buttons to select the **Go To Playlist**, then press the **ENTER** button.
A new Playlist will be created.

Go To Playlist

1 Press the **ANYKEY** button during the Music List playback.


Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ► button.

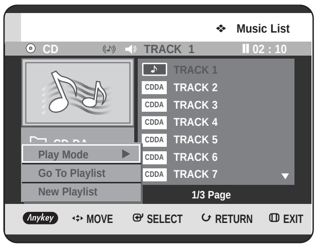

Playlist
CD
TRACK 1
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the desired playlist folder, then press the **ENTER** button.

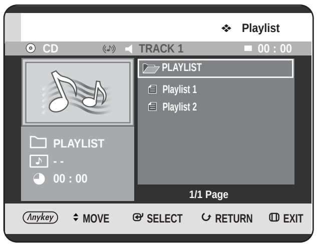
4 The selected tracks are played automatically.

Delete the Playlist

1 Press the **ANYKEY** button during the Music List playback.

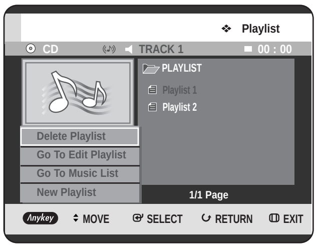

Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

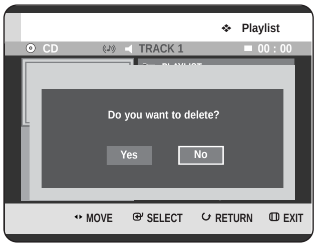

Playlist
CD
TRACK 1
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the **Playlist** you want to delete.

4 Press the **ANYKEY** button.


Playlist
CD
TRACK 1
00 : 00
PLAYLIST
Playlist 1
Playlist 2
Delete Playlist
Go To Edit Playlist
Go To Music List
New Playlist
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

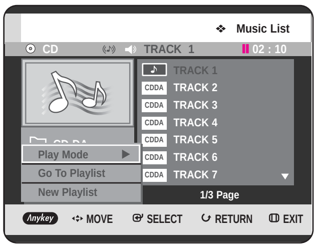
5 Press the ▲▼ buttons to select the **Delete Playlist**, then press the **ENTER** or ▶ button.


Do you want to delete?
Playlist
CD
TRACK 1
00 : 00
Yes
No
MOVE
SELECT
RETURN
EXIT

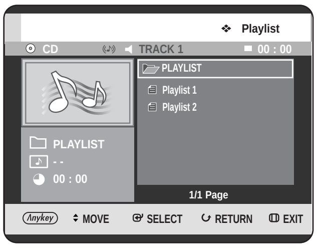
6 Press the ◀▶ buttons to select **Yes**, then press the **ENTER** button. The selected Playlist is deleted.

Go To Edit Playlist

1 Press the **ANYKEY** button during the Music List playback.

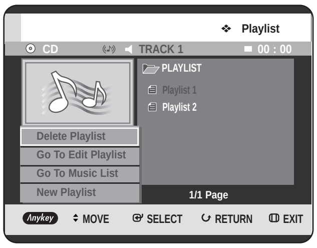

Music List
CD
TRACK 1
02 : 10
TRACK 1
TRACK 2
TRACK 3
TRACK 4
TRACK 5
TRACK 6
TRACK 7
Play Mode
Go To Playlist
New Playlist
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

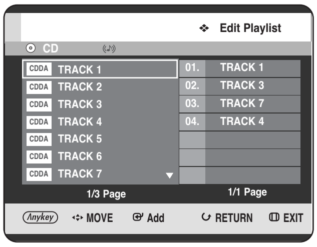

Playlist
CD
TRACK 1
00 : 00
PLAYLIST
Playlist 1
Playlist 2
PLAYLIST
- -
00 : 00
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the **Playlist** you want to edit.

4 Press the **ANYKEY** button in playlist mode.


Playlist
CD
TRACK 1
00 : 00
PLAYLIST
Playlist 1
Playlist 2
Delete Playlist
Go To Edit Playlist
Go To Music List
New Playlist
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

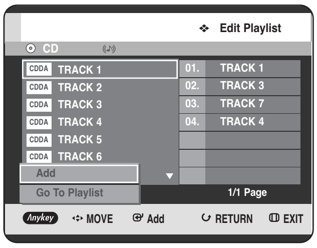
5 Press the ▲▼ buttons to select the **Go To Edit Playlist**, then press the **ENTER** or ▶ button.


Edit Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
01. TRACK 1
02. TRACK 3
03. TRACK 7
04. TRACK 4
1/3 Page
1/1 Page
Anykey
MOVE
Add
RETURN
EXIT

6 Press the ▲▼ buttons to select tracks in order in which you want them to play, then press the **ENTER** button.

7 If you playlisted a wrong track, press the ▶ ▲▼ buttons to select wrong track, then press the **ENTER** or **CANCEL** button.

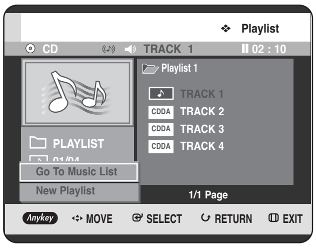
8 To store the playlist, press the **ANYKEY** button.


Edit Playlist
CD
CDDA TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
Add
Go To Playlist
01. TRACK 1
02. TRACK 3
03. TRACK 7
04. TRACK 4
1/1 Page
Anykey
MOVE
Add
RETURN
EXIT

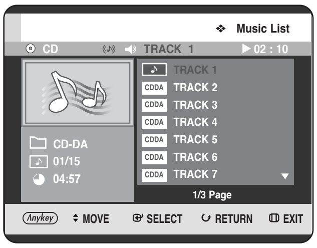
9 Press the ▲▼ buttons to select the **Go To Playlist**, then press the **ENTER** button. Playlist will be edited.

Go To Music List

1 Press the **ANYKEY** button during the Playlist playback.

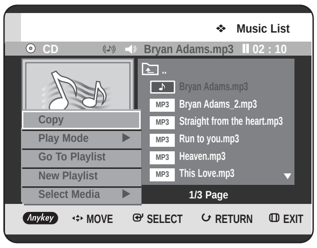

Playlist
CD
TRACK 1
02 : 10
Playlist 1
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
PLAYLIST
Go To Music List
New Playlist
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

2 Press the ▲▼ buttons to select **Go To Music List**, then press the **ENTER** or ▶ button.

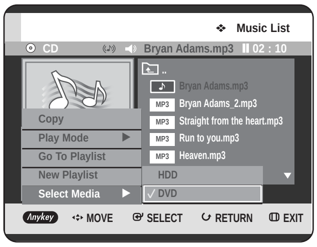

Music List
CD
TRACK 1
02 : 10
TRACK 1
CDDA TRACK 2
CDDA TRACK 3
CDDA TRACK 4
CDDA TRACK 5
CDDA TRACK 6
CDDA TRACK 7
CD-DA
01/15
04:57
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

Select Media (MP3)

1 Press the **ANYKEY** button.


Music List
CD
Bryan Adams.mp3 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
MP3 This Love.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

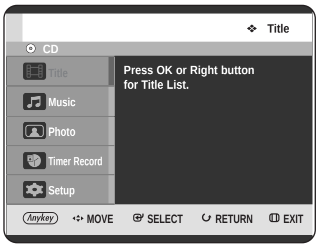
2 Press the ▲▼ buttons to select **Select Media**, then press the **ENTER** or ▶ button.


Music List
CD
Bryan Adams.mp3 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
HDD
✓ DVD
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **HDD** or **DVD**, then press the **ENTER** or ▶ button.
If there are no mp3 files on the selected media, it notifies you that there are no mp3 files and the media will not be switched.

Playing a Picture

1 Insert a JPEG disc or Mixed disc (JPEG + MP3) into the disc tray.


Title
CD
Title
Music
Photo
Timer Record
Setup
Anykey
MOVE
SELECT
RETURN
EXIT

Press OK or Right button for Title List.

2 Press the ▲▼ buttons to select **Photo**, then press the **ENTER** or ▶ button.

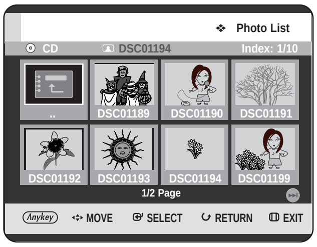


Photo List
CD
DSC01194
Index: 1/10
..
DSC01189
DSC01190
DSC01191
DSC01192
DSC01193
DSC01194
DSC01199
1/2 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ ◀ ▶ buttons to select a picture.
- To see the next 8 pictures, press the **SKIP(⏭)** button.
- To see the previous 8 pictures, press the **SKIP(⏮)** button.

NOTE

- If a disc contains only MP3 files or only JPEG files, the MP3 or JPEG screen appears after the disc is loaded.
- If a disc contains a mix of MP3 and JPEG files, you need to select Music for MP3 files or Photo for JPEG files.

Slide Show

5 Press the **ANYKEY** button.

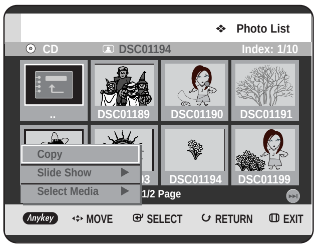


Photo List
CD
DSC01194
Index: 1/10
..
DSC01189
DSC01190
DSC01191
DSC01194
DSC01199
Copy
Slide Show
Select Media
1/2 Page
Anykey
MOVE
SELECT
RETURN
EXIT

6 Press the ▲▼ buttons to select **Slide Show**, then press the **ENTER** or ▶ button.

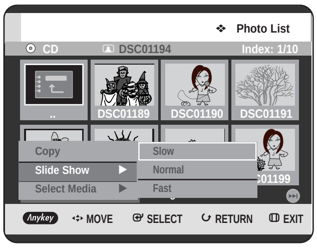
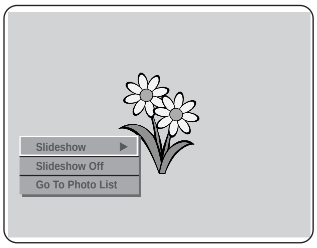


Photo List
CD
DSC01194
Index: 1/10
DSC01189
DSC01190
DSC01191
Copy
Slide Show
Select Media
Slow
Normal
Fast
Anykey
MOVE
SELECT
RETURN
EXIT

7 Press the ▲▼ buttons to select the slide show speed, then press the **ENTER** or ▶ button. The slide show starts.

- To stop the Slide Show -

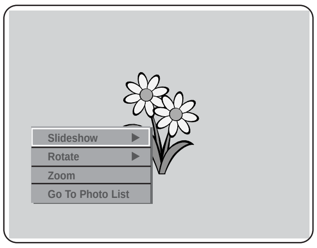
1 Press the **ANYKEY** button.


Slideshow
Slideshow Off
Go To Photo List

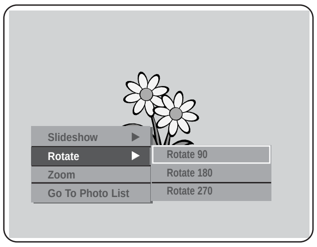
2 Press the ▲▼ buttons to select **Slideshow Off**, then press the **ENTER** or ▶ button.

Rotate

5 Press the **ENTER** button to select you want to see the picture, then press the **ANYKEY** button.


Slideshow
Rotate
Zoom
Go To Photo List

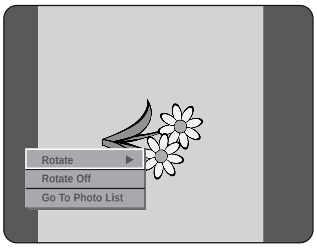
6 Press the ▲▼ buttons to select **Rotate**, then press the **ENTER** or ▶ button.


Slideshow
Rotate
Zoom
Go To Photo List
Rotate 90
Rotate 180
Rotate 270

7 Press the ▲▼ buttons to select the rotate angle, then press the **ENTER** or ▶ button.

- To stop the Rotate -

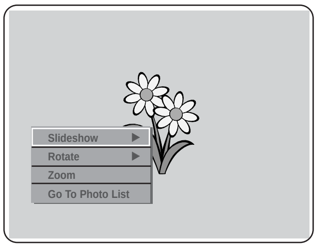
1 Press the **ANYKEY** button.


Rotate
Rotate Off
Go To Photo List

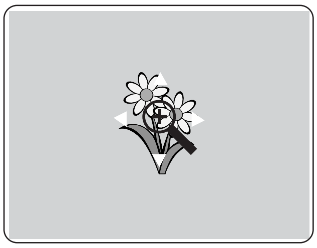
2 Press the ▲▼ buttons to select **Rotate Off**, then press the **ENTER** or ▶ button.

Zoom

5 Press the **ENTER** button to select you want to see the picture, then press the **ANYKEY** button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photo List

6 Press the ▲▼ buttons to select **Zoom**, then press the **ENTER** or ▶ button.

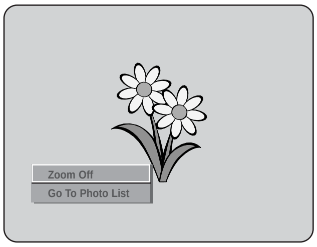


7 Each time the **ENTER** button is pressed, the picture is enlarged up to x4(four times the normal size).

→ **X2 → X4 → X2 → Normal**

- To stop the Zoom -

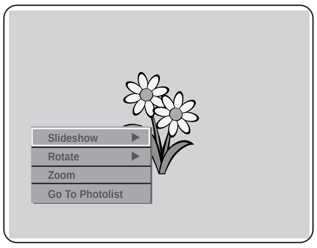
1 Press the **ANYKEY** button.


Zoom Off
Go To Photo List

2 Press the ▲▼ buttons to select **Zoom Off**, then press the **ENTER** or ▶ button.

Go To Photo List

5 Press the **ENTER** button to select you want to see the picture, then press the **ANYKEY** button.


Slideshow ▶
Rotate ▶
Zoom
Go To Photolist

6 Press the ▲▼ buttons to select **Go To Photo List**, then press the **ENTER** or ▶ button.

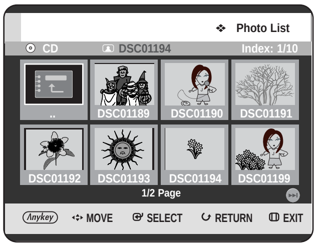


Photo List
CD
DSC01194
Index: 1/10
DSC01189
DSC01190
DSC01191
DSC01192
DSC01193
DSC01194
DSC01199
1/2 Page
Anykey
MOVE
SELECT
RETURN
EXIT

Recording

This section shows various HDD & DVD Recording methods.

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Editing the Timer Record List 85
Deleting a Timer Record List 86
Go To History List 87

Before Recording

This unit can record on various types of discs. Before recording, read the following instructions and select the disc type according to your preference.

Recordable Discs

This recorder can record on the following discs.

HDD	DVD-RAM	DVD-RW	DVD-R
HDD	DVD RAM	DVD RW	DVD R

•DVD-RWs and DVD-RAMs are rewritable.
•DVD-Rs are non-rewritable

Compatibility between Samsung and Other Company's Recorder

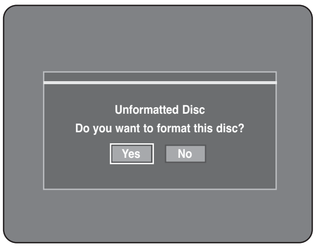
Disc Types	Recording format	Recording Device	Finalizing	Additional Recording in Samsung Recorder
DVD-RAM	VR Mode	Samsung	X	Recordable
		Other Company	X	Recordable
DVD-RW	VR Mode	Samsung	finalized	Not recordable
			not finalized	Recordable
		Other Company	finalized	Not recordable
			not finalized	Recordable
	V Mode	Samsung	finalized	Not recordable
			not finalized	Recordable
		Other Company	finalized	Not recordable
			not finalized	Not recordable
DVD-R	V Mode	Samsung	finalized	Not recordable
			not finalized	Recordable
		Other Company	finalized	Not recordable
			not finalized	Not recordable

NOTE

- Finalize
  - This closes the DVD-RW/-R so no additional recording can be done.
- Unfinalize
  - This allows additional recording on a DVD-RW disc originally recorded on the HDD & DVD RECORDER.
  - A DVD-RW disc that has been recorded by DAO(Disc At Once) in a PC cannot be unfinalized.
  - A DVD-RW disc that has been recorded in Video Mode of a different maker's recorder cannot be unfinalized.
  - A DVD-R disc cannot be unfinalized.

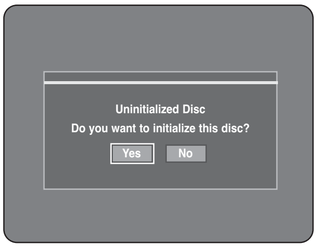
Recording Formats

When you insert an unused disc, the following message appears. Since available functions differ depending on the disc type, select a disc that best fits your preferences.
DVD-RAM: Use after formatting the disc.



Unformatted Disc
Do you want to format this disc?

DVD-RW: When unused DVD-RW disc is first inserted, the message “Uninitialized Disc Do you want to initialize this disc?” will be displayed. If you select **Yes**, the disc will be formatted in VR mode.
If you want to change the mode, refer to Formatting a Disc on page 118.



Uninitialized Disc
Do you want to initialize this disc?

DVD-R: Formatting DVD is unnecessary and only Video Mode Recording is supported.

DVD-RW(V mode)/-R

- Chapters will be created automatically when you finalize recording on DVD-RW/-R discs in Video mode.
  The chapter’s length (interval between chapters) varies according to the recording mode.
- Simple editing (erasing titles/changing title name)

DVD-RAM/-RW(VR mode)

- This mode allows multiple editing functions (such as deletion of the whole title, partial deletion of a title, etc.)
- Various editing options using a created Playlist.

Recording Mode

Select one of four recording modes by pressing the **REC MODE** button repeatedly while the unit is in Stop mode for the desired recording time and picture quality. In general, picture quality improves as the recording time decreases. In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes and you can use this mode for timer recording.

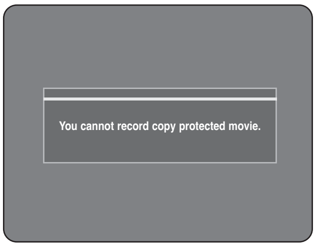
Recording Mode	Recording Times	
	HDD (120GB)	DVD-RAM/-RW/-R
XP (high quality mode)	Approx. 28 hours	Approx. 1 hour about 8.5 Mbps
SP (standard quality mode)	Approx. 52 hours	Approx. 2 hours about 4.5 Mbps
LP (long recording mode)	Approx. 102 hours	Approx. 4 hours about 2 Mbps
EP (extended mode)	Approx. 157 hours	Approx. 6 hours/ about 1.6 Mbps
	Approx. 208 hours	Approx. 8 hours/ about 1.2 Mbps
FR (Flexible Recording)	Approx. 28~157 hours	Approx.1~6 hours

NOTE

- Recording time may vary according to specific conditions.

Unrecordable video

Video with copy protection cannot be recorded on this HDD & DVD RECORDER.
When the HDD & DVD RECORDER receives a copy guard signal while recording, recording stops and the following message appears on the screen.



You cannot record copy protected movie.

Concerning Copy Control Signals

TV broadcasts that contain copy control signals may have one of the following three signal types, Copy-Free, Copy-Once and Copy-Never. If you want to record a copy-once type program, use DVD-RW with CPRM in VR Mode and DVD-RAM.

Media \ Signal type	Copy-Free	Copy-Once	Copy-Never
DVD-RW(Ver.1.1)	O	-	-
DVD-RW(Ver.1.1) with CPRM			
VR mode	O	O*	-
V mode	O		-
DVD-R	O		-
DVD-RAM(Ver.2.0)	O	O*	-

This * marked parts are compatible with CPRM.

Once “Copy Once” has been recorded, recording cannot be done anymore.

- Content Protection for Recordable Media (CPRM)
CPRM is a mechanism that ties a recording to the media on which it is recorded. It is supported by some HDD & DVD RECORDERs, but not by many DVD players. Each blank recordable DVD has a unique 64-bit media ID etched in the BCA. When protected content is recorded onto the disc, it can be encrypted with a 56-bit C2 (Cryptomeria) cipher derived from the media ID.

During playback, the ID is read from the BCA and used to generate a key to decrypt the contents of the disc. If the contents of the disc are copied to other media, the ID will be absent or wrong and the data will not be decryptable.

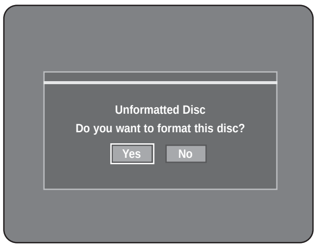
Recording the current TV program you are watching

HDD DVD-RAM DVD-RW DVD-R

Check that the disc has enough available space for the recording. Adjust the recording mode.

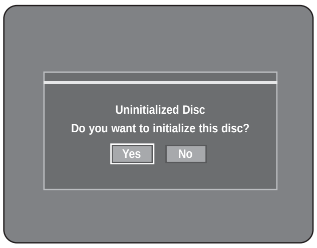
1 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.
Press the **OPEN/CLOSE** button to close the disc tray.
Wait until **LOAD** disappears from the front panel display.

If an unused DVD-RAM disc is used, you will be prompted to format first. Make your selection using the ◄► buttons, then press **ENTER** button.(See page 75)



Unformatted Disc
Do you want to format this disc?

If an unused DVD-RW disc is used, whether to initialize or not will be asked first. Make your selection, then press the **ENTER** button.(See page 75)

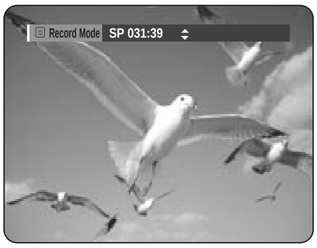


Uninitialized Disc
Do you want to initialize this disc?

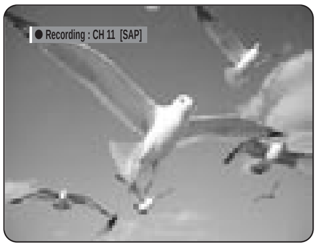
2 Press the **CH (** ⌃ ⌄ **)** or number buttons to select the current program you want to record.

3 Press the **REC MODE** button repeatedly, (or press the **REC MODE** button and then press the ▲▼ buttons) to select the recording speed(quality).

SP → LP → EP → XP



4 Press the **REC** button.
Information concerning the channel is displayed on the screen, then recording begins.
Icon(○) is displayed on the front panel.



- To pause recording -

- Press the **REC PAUSE** button to pause a recording in progress.
- Press the **REC PAUSE** button again during pause to resume recording.
- You can switch channels by pressing the **CH (⌃ ⌄)** buttons while recording pauses.

- To stop recording -

Press the **STOP (⊙)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message "Updating the information of disc. Please wait for a moment" is displayed.

NOTE

- You cannot change the recording mode and the channel while recording.
- Recording will stop automatically if there is no free space left for recording.
- Up to 99 titles can be recorded onto a disc.(DVD-RAM/-RW/-R)
- Up to 999 titles can be registered on the HDD.
- HDD recording is available for up to 24 hours, and when recording for 24 hours, 4 titles will be recorded with each title has 6 hours in length.
- Recording will stop automatically if a copy protected image is selected.
- DVD-RAM/-RW discs must be formatted before starting to record. Most new discs are sold unformatted.
- Do not use DVD-R authoring discs with this unit.

Recording from external equipment you are watching

HDD DVD-RAM DVD-RW DVD-R

Before you start

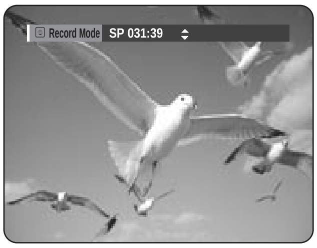
Check that the disc has enough available space for the recording. Adjust the recording mode.

1 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray.
Wait until **LOAD** disappears from the front panel display.
If an unused DVD-RAM disc is used, whether to format or not will be asked first. (See page 75)
If an unused DVD-RW disc is used, whether to initialize or not will be asked first. (See page 75)

2 Press the **INPUT** button to select the input source according to the connection you made.
The front panel display changes in the following sequence:
→ CH Number → AV 1 → AV 2 → DV

If you connect a digital camcorder, press the **INPUT** button to select **DV**. (See page 79)

3 Press the **REC MODE** button repeatedly, (or press the **REC MODE** button, then press the ▲▼ buttons) to select the recording speed (quality).
→ SP → LP → EP → XP



Record Mode SP 031:39

4 Press the **REC** button.
Information concerning the external input mode is displayed on the screen, then recording begins.
Icon(◯) is displayed on the front panel.

- To pause recording -

- Press the **REC PAUSE** button to pause a recording in progress.
- Press the **REC PAUSE** button again during pause to resume recording.
- You can switch channels by pressing the **CH (⌃ ⌄)** buttons while recording pauses.

- To stop recording -

Press the **STOP (⊙)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message “Updating the information of disc. Please wait for a moment” is displayed.

Copying from a Camcorder

You may control the Camcorder using the IEEE1394 (DV) interface.

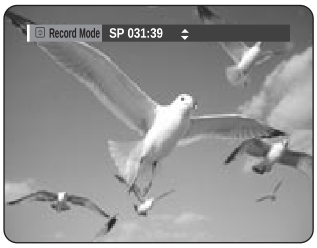
HDD DVD-RAM DVD-RW DVD-R

1 Connect the DV output jack of your camcorder to the DV input jack on the front of your HDD & DVD RECORDER using a DV cable.

2 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display.

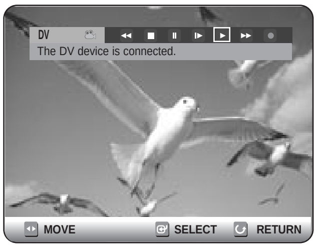
3 Press the **REC MODE** button repeatedly to select the recording speed(quality).

SP → LP → EP → XP



Record Mode SP 031:39

4 Press the **INPUT** button to select **DV**.
If the input is set to DV, a playback/record menu that enables camcorder control appears on the top of the screen.



The DV device is connected.

5 Select the Play (▶) icon on the upper part of the screen to playback the camcorder and find the starting position to copy.

You can press the **PLAY (⏯)** button of the remote control to play the camcorder.

6 To start recording, use the ◀ ▶ buttons to select Record (●) icon in the top side of the screen, then press the **ENTER** button.
You can press the **REC** button of the remote control to start recording. To display playback related icons on the screen, press any direction button on the remote control.

- To stop recording -

Press the **STOP (⊡)** button to stop or finish a recording in progress.

- When using DVD-RAM/-RW/-R discs, the message “Updating the information of disc. Please wait for a moment” is displayed

Making an One Touch Recording (OTR)

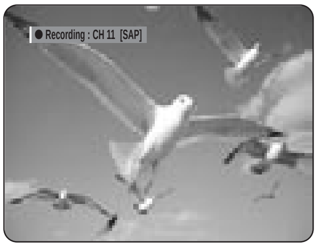
You can set the HDD & DVD RECORDER to record in 30-minute increments up to 8 hours by pressing the **REC** button.

HDD DVD-RAM DVD-RW DVD-R

1 Press the **HDD** or **DVD** button.
If you select DVD, Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray. Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display.

2 If you want to record a TV channel, press the **CH (⌃⌄)** buttons or number buttons to select a desired channel. If you want to record through a connected external component, press the **INPUT** button to select an appropriate external input (AV 1, AV 2, DV or CH 01).

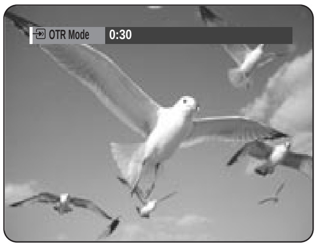
3 Press the **REC** button to start recording.



● Recording : CH 11 [SAP]

4 Press the **REC** button repeatedly to adjust the desired recording time.

→ 0:30 → 1:00 → ... 8:00 → Off



OTR Mode 0:30

NOTE

- The timer counter decreases by the minute from 8:00 to 0:00, then the HDD & DVD RECORDER stops recording.

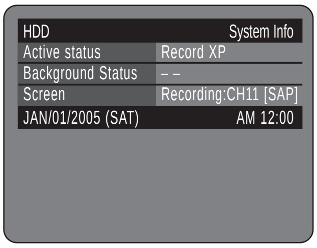
- To stop recording -

Press the **STOP (⊙)** button. The message “Do you want to stop recording?” is displayed.

- Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
- Or press the **STOP (⊙)** button again.

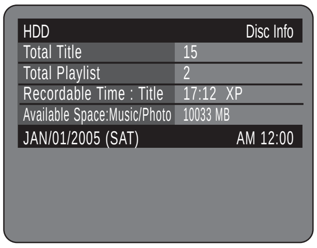
About INFO button

During recording, press the **INFO** button once, the system information screen appears.: Displays Active Status, Background Status, and Main Screen information.



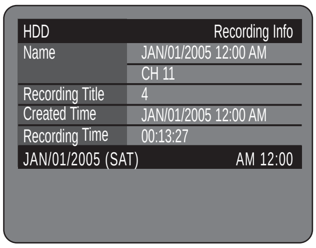
HDD System Info
Active status Record XP
Background Status – –
Screen Recording:CH11 [SAP]
JAN/01/2005 (SAT) AM 12:00

Pressing the **INFO** button twice, Disc information screen appears.: Displays Total numbers of Titles and Playlists, Recordable Time(Title), Available Space(Music/Photo).



HDD Disc Info
Total Title 15
Total Playlist 2
Recordable Time : Title 17:12 XP
Available Space:Music/Photo 10033 MB
JAN/01/2005 (SAT) AM 12:00

Pressing the **INFO** button three times: Current recording information screen appears.: Displays information of recording Name, Title, Created Time and Recording Time.



HDD Recording Info
Name JAN/01/2005 12:00 AM
CH 11
Recording Title 4
Created Time JAN/01/2005 12:00 AM
Recording Time 00:13:27
JAN/01/2005 (SAT) AM 12:00

Chasing Play

You can play back from the beginning of the program you are recording.

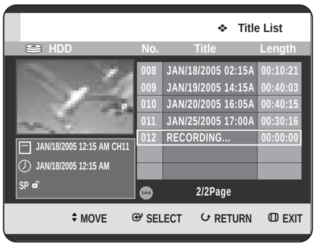
HDD

While Recording

1 Press the **PLAY (▶II)** button.
It plays back the title that you are currently recording from the beginning.
Playback is not available for 10 seconds from the start of recording.
You can use the **SKIP (⏮ ⏭)** and other playback-related buttons to view the previous recorded list.

Using the TITLE LIST button

1 With the unit in recording mode, press the **TITLE LIST** button.
The Title List screen is displayed.
Press the **▲▼/SKIP (⏮ ⏭)** buttons to select the recording title list.



JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

No.	Title	Length
008	JAN/18/2005 02:15A	00:10:21
009	JAN/19/2005 14:15A	00:40:03
010	JAN/20/2005 16:05A	00:40:15
011	JAN/25/2005 17:00A	00:30:16
012	RECORDING...	00:00:00

2 Press the **ENTER** or **PLAY (▶II)** button.
It plays back the title that you are currently recording from the beginning.

- Stopping Playback / Recording -

1 Press the **STOP (■)** button. Playback screen disappears and the recording in progress screen appears.

2 Pressing the **STOP (■)** button once more will stop the recording.

NOTE

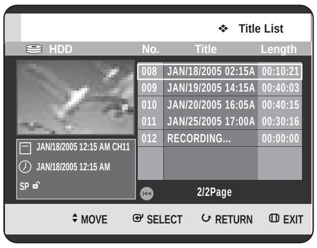
- No sound is heard during search mode.
- DVD disc playback is available during HDD recording. However, JPEG, MP3, and DivX files in the disc cannot be played back.
- HDD playback is available during DVD recording. However, JPEG and MP3 files in the HDD cannot be played back.

Simultaneous Recording and Playback

You can watching the previous title list while recording a program.

Using the TITLE LIST button

1 With the unit in recording mode, press the **TITLE LIST** button.
The Title List screen is displayed.



❖ Title List

HDD

No.	Title	Length
008	JAN/18/2005 02:15A	00:10:21
009	JAN/19/2005 14:15A	00:40:03
010	JAN/20/2005 16:05A	00:40:15
011	JAN/25/2005 17:00A	00:30:16
012	RECORDING...	00:00:00

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

2/2Page

2 Press the ▲▼/ **SKIP** (⏮⏭) buttons to select the title, then press the **ENTER** or **PLAY** (⏯) button.
Selected title list will be played back.

- Stopping Playback / Recording -

1 Press the **STOP** (⊙) button. Playback screen disappears and the recording in progress screen appears.

2 Pressing the **STOP** (⊙) button once more will stop the recording.

NOTE

- No sound is heard during search mode.

Making a Timer Recording

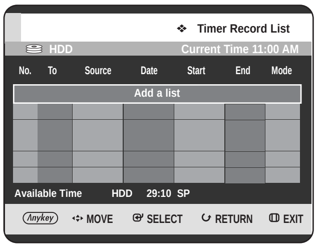
HDD DVD-RAM DVD-RW DVD-R

1. Check the antenna cable is connected.
2. Check the remaining time of the disc.
3. Check the date and time are correct.

Make sure the Clock (Setup-Clock Set) must be set before you proceed with a timer recording. (See pages 27~29)

Using the TIMER button

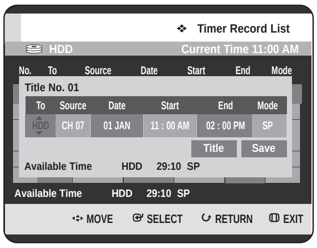
1 With the unit in Stop mode/Playback mode, press the **TIMER** button.
The **Timer Record List** screen is displayed.


❖ Timer Record List
HDD
Current Time 11:00 AM
No.
To
Source
Date
Start
End
Mode
Add a list
Available Time HDD 29:10 SP
Anykey
MOVE
SELECT
RETURN
EXIT

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Timer Record**, then press the **ENTER** or ▶ button.

2 Press the **ENTER** button to select **Add a list**.
The Timer Record List screen is displayed.


❖ Timer Record List
HDD
Current Time 11:00 AM
No.
To
Source
Date
Start
End
Mode
Title No. 01
To
Source
Date
Start
End
Mode
HDD
CH 07
01 JAN
11 : 00 AM
02 : 00 PM
SP
Title
Save
Available Time HDD 29:10 SP
Available Time HDD 29:10 SP
MOVE
SELECT
RETURN
EXIT

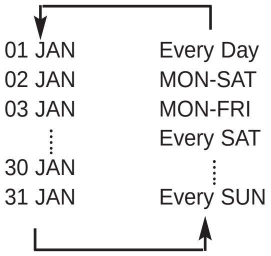
Using the ANYKEY button.

- Press the **ANYKEY** button.
- Press the ▲▼ buttons to select **Add**, then press the **ENTER** or ▶ button.

3 Set timer recording option.
- Fill the input items using the ▲▼◀ ▶ buttons and number buttons.

◀ ▶ : Moves to the previous/next item.
▲▼ **0~9** : Sets a value.

- **To** : Select the media to record HDD or DVD.
- **Source** : The video input source (AV1, AV2 or DV), or the broadcasting channel you want to make a timer recording from.
- **Date** : Timer Recording allows setting the recording time within one month period. Set the recording day. (day/month)


01 JAN
02 JAN
03 JAN
30 JAN
31 JAN
Every Day
MON-SAT
MON-FRI
Every SAT
Every SUN

- **Start/End Time** : Start and end time of the timer recording.
- **Mode (Recording Mode) :**
- FR (Flexible Recording) : Select when you want to set video quality automatically. In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes.
- XP (high quality) : Select when video quality is important.
- SP (standard quality) : Select to record in standard quality.
- LP (low quality) : Select when a long recording time is required.
- EP (extended) : Select when a longer recording time is required.

NOTE

- When you are recording at EP mode on a DVD-RW(V mode)/-R disc, it may not record the full 6 or 8 hours because the unit uses the VBR(Variable Bit Rate) ENCODING system. For example, if you record a program with a lot of action, it uses a higher bit rate which in turn consumes more disc memory.

- **TITLE** : To label the title name, select the title and then press the **ENTER** button.Title renaming screen appears. See page 91 for the registration.

4 After selecting the set up value for each mode, press the **ENTER** button to select **Save**, and press the **ENTER** button again.

- ◷ will appear on the front panel. It means that a timer recording is registered.

If the timer settings overlap;
The programs are recorded in order of priority. If timer recording is set for the first program and then again for the second program and both programs overlap, the following message will appear on the screen: “This setting is identical with 1.” The message shows that the first program has priority. After recording of the first program is complete, the second program starts being recorded.

To exit without saving the current setting
Press the **MENU** button.

To return to the previous menu
Press the **RETURN** button if you don’t want to set a timer recording.

5 When you want to recording on DVD-RAM/-RW/-R, you must insert the disc.

6 Press the MENU button to finish the Timer Recording setting.

NOTE

- The timer recording time may differ from the set time depending on disc status and overall timer recording status (for example, recording times overlapping, or when the previous recording ends within 2 minutes before the start time of the next recording.)
- You can make the Timer Recording up to 12 programes.
- If HDD disk has no available recording space, ◷ blinks. It means that HDD disk has no space to record.

Flexible Recording (for Timer recording only)

HDD DVD-RAM DVD-RW DVD-R

In FR mode, the most suitable record mode is adjusted automatically, according to remaining time on the disc and length of the timer recording. This function is selected only one mode in XP, SP, LP and EP modes and you can use this mode for timer recording.

The FR mode recording setup is the same as Timer Recording. When setting the mode in step 4, set the FR mode.

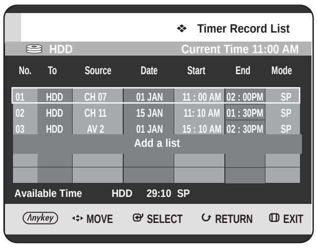
Editing the Timer Record List

Follow these directions to edit the timer record list.

HDD DVD-RAM DVD-RW DVD-R

Using the TIMER button

1 With the unit in Stop mode/Playback mode, press the **TIMER** button.
The Timer Record List screen is displayed.


Timer Record List
HDD
Current Time 11:00 AM
Anykey
MOVE
SELECT
RETURN
EXIT

No.	To	Source	Date	Start	End	Mode
01	HDD	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP
02	HDD	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP
03	HDD	AV 2	01 JAN	15 : 10 AM	02 : 30PM	SP

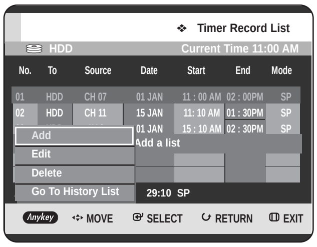
Add a list

Available Time HDD 29:10 SP

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Timer Record**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the number of the Timer Record List you want to edit, then press the **ANYKEY** button.
- The **Add**, **Edit**, **Delete** and **Go To History List** items are displayed.

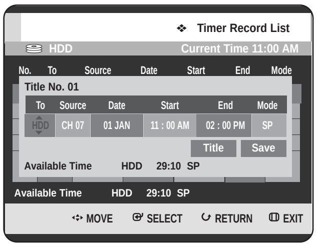

Timer Record List
HDD
Current Time 11:00 AM
Add
Edit
Delete
Go To History List
Anykey
MOVE
SELECT
RETURN
EXIT

No.	To	Source	Date	Start	End	Mode
01	HDD	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP
02	HDD	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP
			01 JAN	15 : 10 AM	02 : 30PM	SP

Add a list

29:10 SP

3 Press the ▲▼ buttons to select **Edit**, then press the **ENTER** or ▶ button.
- The Timer Record Input item is displayed.
  Edit the items you want to modify. See the “Making a Timer Recording” section for more information on Timer Recording Input items.(See page 83)


Timer Record List
HDD
Current Time 11:00 AM
No.
To
Source
Date
Start
End
Mode
Title
Save
MOVE
SELECT
RETURN
EXIT

Title No. 01

To	Source	Date	Start	End	Mode
HDD	CH 07	01 JAN	11 : 00 AM	02 : 00 PM	SP

Available Time HDD 29:10 SP

Available Time HDD 29:10 SP

4 Press the **ENTER** button to select **Save**, then press the **ENTER** button to confirm the edited setting.

5 Press the **MENU** button after finishing the operation.
The Timer Record List screen will disappear.

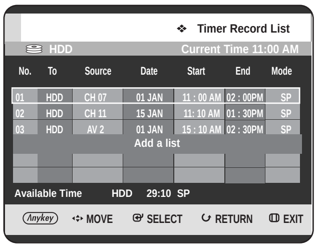
Deleting a Timer Record List

Follow these directions to delete an entry from the timer record list.

HDD DVD-RAM DVD-RW DVD-R

Using the TIMER button

1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Timer Record List screen is displayed.


❖ Timer Record List

HDD Current Time 11:00 AM

No.	To	Source	Date	Start	End	Mode
01	HDD	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP
02	HDD	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP
03	HDD	AV 2	01 JAN	15 : 10 AM	02 : 30PM	SP

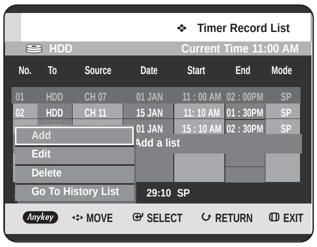
Add a list

Available Time HDD 29:10 SP

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Timer Record**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the number of the Timer Record List you want to delete, and then press the **ANYKEY** button.
- The **Add**, **Edit**, **Delete** and **Go To History List** items are displayed.


❖ Timer Record List

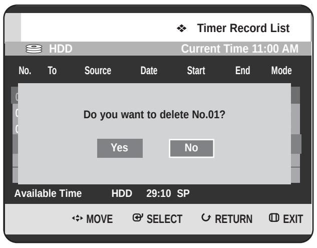
HDD Current Time 11:00 AM

No.	To	Source	Date	Start	End	Mode
01	HDD	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP
02	HDD	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP
			01 JAN	15 : 10 AM	02 : 30PM	SP

Add a list

29:10 SP

3 Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.
- You will be prompted with the delete confirm message such as "Do you want to delete No.01?".


❖ Timer Record List

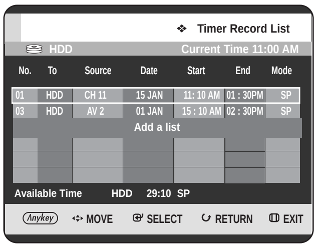
HDD Current Time 11:00 AM

No. To Source Date Start End Mode

Do you want to delete No.01?

Available Time HDD 29:10 SP

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
- The selected entry will be deleted from the list.


❖ Timer Record List

HDD Current Time 11:00 AM

No.	To	Source	Date	Start	End	Mode
01	HDD	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP
03	HDD	AV 2	01 JAN	15 : 10 AM	02 : 30PM	SP

Add a list

Available Time HDD 29:10 SP

5 Press the **MENU** button after finishing the operation. The Timer Record List screen will disappear.

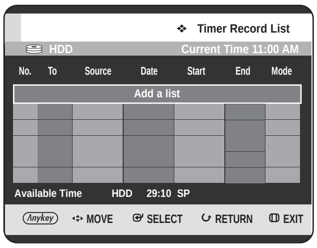
Go To History List

You can confirm the performance results of title lists that have passed the reserved recording time.

HDD DVD-RAM DVD-RW DVD-R

Using the TIMER button

1 With the unit in Stop mode/Playback mode, press the **TIMER** button. The Timer Record List screen is displayed.


Timer Record List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

Current Time 11:00 AM

No.	To	Source	Date	Start	End	Mode
Add a list						

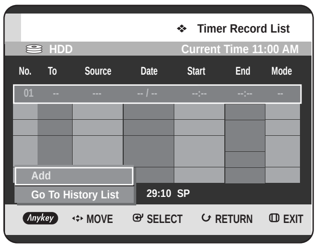
Available Time HDD 29:10 SP

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Timer Record**, then press the **ENTER** or ▶ button.

2 Press the **ANYKEY** button.

- The **Add** and **Go To History List** items are displayed.

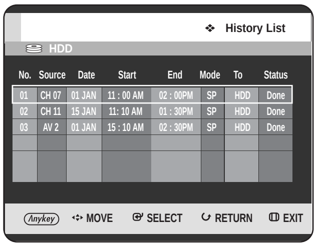

Timer Record List
HDD
Add
Go To History List
Anykey
MOVE
SELECT
RETURN
EXIT

Current Time 11:00 AM

No.	To	Source	Date	Start	End	Mode
01	--	---	-- / --	--:--	--:--	--

29:10 SP

3 Press the ▲▼ buttons to select **Go To History List**, then press the **ENTER** or ▶ button.
The History List screen is displayed.


History List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

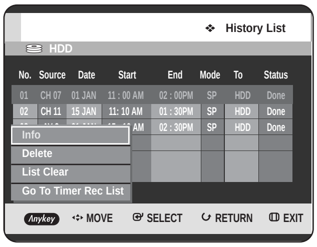
No.	Source	Date	Start	End	Mode	To	Status
01	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP	HDD	Done
02	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP	HDD	Done
03	AV 2	01 JAN	15 : 10 AM	02 : 30PM	SP	HDD	Done

4 Press the **MENU** button after finishing the operation.
The History List screen will disappear.

Information about History List

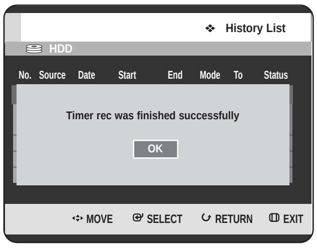
Informs whether the selected History List performed a Timer Recording successfully.

3-1 Press the ▲▼ buttons to select the number of the History List, then press the **ANYKEY** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	To	Status
01	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP	HDD	Done
02	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP	HDD	Done
			AM	02 : 30PM	SP	HDD	Done

4 Press the ▲▼ buttons to select **Info**, then press the **ENTER** or ▶ button.

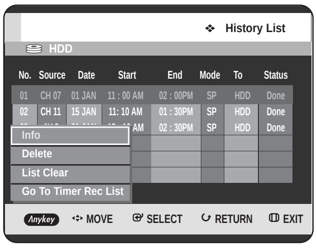

History List
HDD
No.
Source
Date
Start
End
Mode
To
Status
OK
MOVE
SELECT
RETURN
EXIT

Timer rec was finished successfully

Delete History List

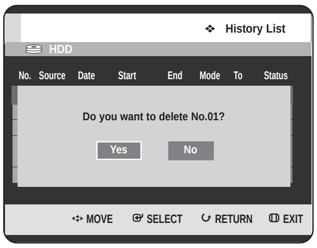
Deletes a History List individually.

3-1 Press the ▲▼ buttons to select the number of the history list you want to delete, and then press the **ANYKEY** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	To	Status
01	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP	HDD	Done
02	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP	HDD	Done
			AM	02 : 30PM	SP	HDD	Done

4 Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.

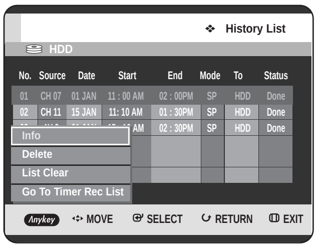

History List
HDD
No.
Source
Date
Start
End
Mode
To
Status
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete No.01?

Clear History List

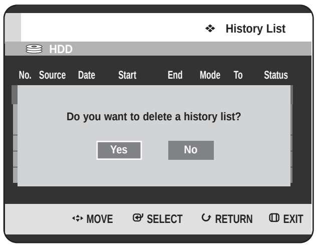
Clears all History Lists at once.

3-1 Press the **ANYKEY** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	To	Status
01	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP	HDD	Done
02	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP	HDD	Done
			AM	02 : 30PM	SP	HDD	Done

4 Press the ▲▼ buttons to select **List Clear**, then press the **ENTER** or ▶ button.

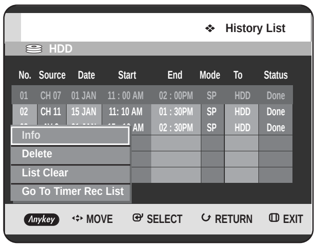

History List
HDD
No.
Source
Date
Start
End
Mode
To
Status
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete a history list?

Go To Timer Rec List

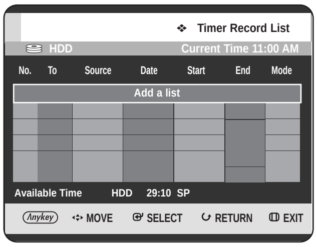
Switches directly from the History List to the Timer Rec List.

3-1 Press the **ANYKEY** button.


History List
HDD
Info
Delete
List Clear
Go To Timer Rec List
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Source	Date	Start	End	Mode	To	Status
01	CH 07	01 JAN	11 : 00 AM	02 : 00PM	SP	HDD	Done
02	CH 11	15 JAN	11: 10 AM	01 : 30PM	SP	HDD	Done
			AM	02 : 30PM	SP	HDD	Done

4 Press the ▲▼ buttons to select **Go To Timer Rec List**, then press the **ENTER** or ▶ button.


Timer Record List
HDD
Current Time 11:00 AM
No.
To
Source
Date
Start
End
Mode
Add a list
Anykey
MOVE
SELECT
RETURN
EXIT

Available Time HDD 29:10 SP

Editing

This section introduces basic functions of editing and explains both edit functions for the recording on a disc and edit functions for the entire disc.

Basic Editing (Title List) 91

Advanced Editing (Playlist) 98

Copying from HDD to DVD 106

Copying Multiple Titles at One Time 109

Copying from DVD to HDD 113

Copying MP3 or JPEG Files from a Disc to HDD . . .114

Disc Manager 116

- **Title List**
A title is a section of recorded video and audio.
Title List shows a list to help you select a title.
Since the title consists of the information on stream that is actually recorded, if one title is deleted, that title cannot be played again.

- **Play List**
This refers to a unit of playback, which is made by selecting a desired scene in the entire Title List.
When one playlist is played, only the scene selected by the user will play and then stop. Since only the information necessary for playing a desired scene is included in a playlist, even if that playlist is deleted, the original stream will not be deleted.

Recording or editing might not be completed if an error, such as a sudden power failure occurs. Please be aware that a material that has been damaged is unable to be retrieved to its original content.

Basic Editing (Title List)

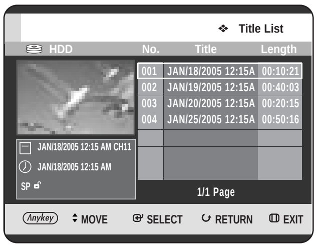
Renaming(Labeling) a Title

Follow these instructions to rename a title list entry, i.e., to edit the title of a recorded program.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

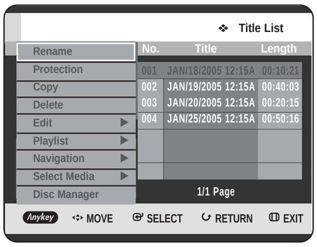
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

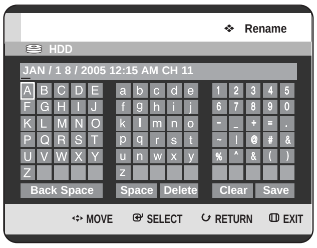
2 Press the ▲▼ buttons to select an entry you want to rename from the Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

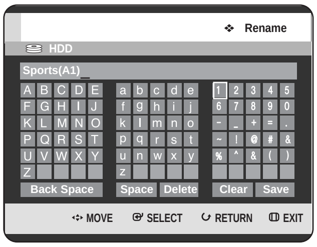
1/1 Page

3 Press the ▲▼ buttons to select **Rename**, then press the **ENTER** or ▶ button.
The Rename screen is displayed.


Rename
HDD
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u n w x y z
1 2 3 4 5 6 7 8 9 0 - _ + = . ~ ! @ # & % ^ & ( )
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

JAN / 1 8 / 2005 12:15 AM CH 11

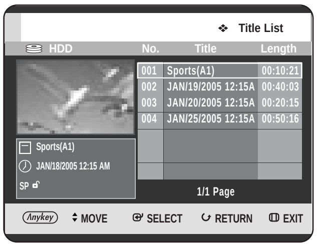
4 Select the desired characters using the ▲▼ ◀ ▶ buttons, press the **ENTER** button.


Rename
HDD
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
a b c d e f g h i j k l m n o p q r s t u n w x y z
1 2 3 4 5 6 7 8 9 0 - _ + = . ~ ! @ # & % ^ & ( )
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

Sports(A1)_

- **Back Space:** Deletes and moves the cursor backwards by one position. (Equivalent to the **CANCEL** button)
- **Space:** Enters a blank and moves the cursor one forward (to the right).
- **Delete:** Deletes the character at the cursor position.
- **Clear:** Deletes all the character inputs.
- **Save:** Registers the character inputs.

5 Press the ▲▼ ◀ ▶ buttons to select **Save**, and then press the **ENTER** button.
The changed title name is displayed on the title item of the selected entry.


Title List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	Sports(A1)	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Sports(A1)
JAN/18/2005 12:15 AM
SP
1/1 Page

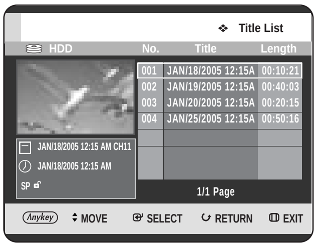
Locking (Protecting) a Title

Follow these instructions to lock an entry to protect it from accidental deletion.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button .
The Title List screen is displayed.


Title List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

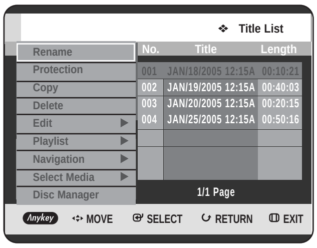
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

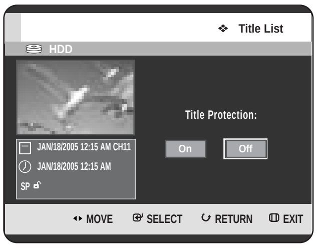
2 Press the ▲▼ buttons to select an entry you want to protect from the Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

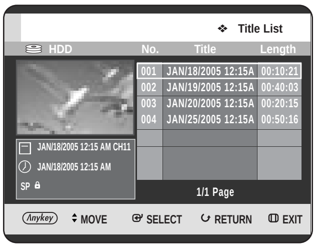
3 Press the ▲▼ buttons to select **Protection**, then press the **ENTER** or ▶ button.


Title List
HDD
On
Off
MOVE
SELECT
RETURN
EXIT

Title Protection:

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

4 Press the ◀ ▶ buttons to select **On**, then press the **ENTER** button. The key icon on the information window for the selected entry changes to the locked status. (🔓 → 🔒)


Title List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP 🔒

1/1 Page

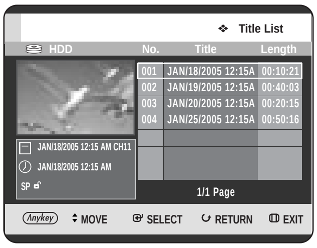
Deleting a Title

Follow these instructions to delete an entry from the Title List.

HDD DVD-RAM DVD-RW DVD-R

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
Anykey
MOVE
SELECT
RETURN
EXIT

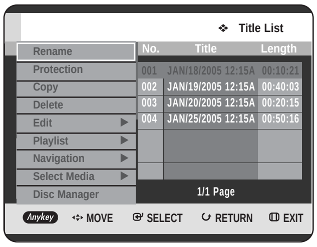
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

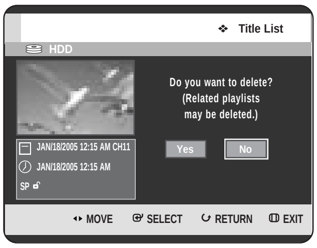
2 Press the ▲▼ buttons to select an entry you want to delete in the Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

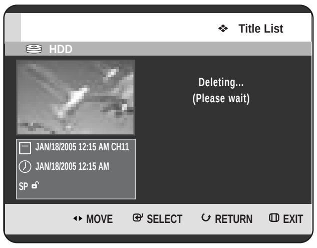
3 Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.


Title List
HDD
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
Yes
No
MOVE
SELECT
RETURN
EXIT

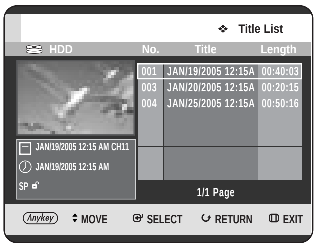
Do you want to delete?
(Related playlists
may be deleted.)

- The message may be different depend on the type of disc. You will be prompted with the confirmation message. HDD, DVD-RAM(VR mode), DVD-RW(VR mode): Since Playlist is present, the message “Do you want to delete? (Related playlists may be deleted.)” is displayed. DVD-RW(Video mode)/-R: Since Playlist is not present, the message “Do you want to delete?” is displayed.

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.


Title List
HDD
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
MOVE
SELECT
RETURN
EXIT

Deleting...
(Please wait)


Title List
HDD
JAN/19/2005 12:15 AM CH11
JAN/19/2005 12:15 AM
SP
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

NOTE

- You cannot delete a protected entry. If you want to delete a protected entry, select "Off" in the Title Protection menu. (See page 92)
- When the Disc Protection has been set to Protected, you cannot delete titles. (See page 117)
- Once an entry is deleted from the Title List it cannot be recovered.
- Once DVD-RW/-R is finalized, it cannot be deleted.

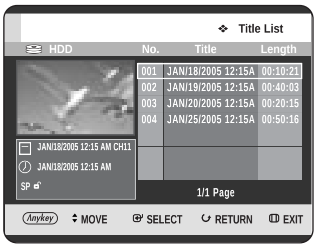
Splitting a Section of a Title (Split)

Follow these instructions to split a section of a Title List entry.

HDD

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
Anykey
MOVE
SELECT
RETURN
EXIT

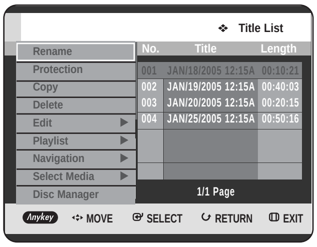
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

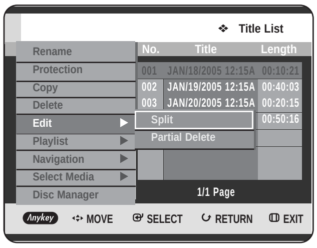
2 Press the ▲▼ buttons to select an entry you want to Split from the Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
Anykey
MOVE
SELECT
RETURN
EXIT

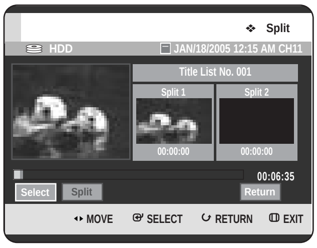
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

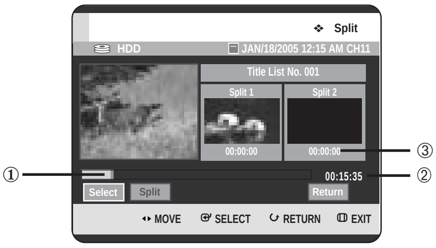
3 Press the ▲▼ buttons to select **Edit**, then press the **ENTER** or ▶ button.


Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
No. Title Length
001 JAN/18/2005 12:15A 00:10:21
002 JAN/19/2005 12:15A 00:40:03
003 JAN/20/2005 12:15A 00:20:15
Split
Partial Delete
00:50:16
1/1 Page
Anykey MOVE SELECT RETURN EXIT

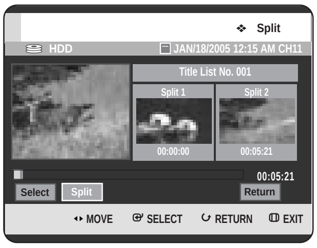
4 Press the ▲▼ buttons to select **Split**, then press the **ENTER** or ▶ button.


Split
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Split 1
Split 2
00:00:00
00:00:00
00:06:35
Select
Split
Return
MOVE SELECT RETURN EXIT

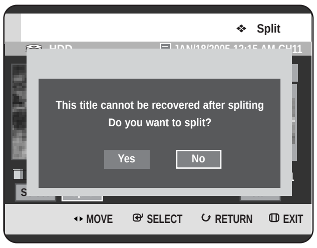
5 Using the playback-related buttons (**PLAY(⏯)**, **SEARCH (⏪ ⏩)**), move to a point for splitting and press the **ENTER** button.
If it is not the point where you want to split, press the **RETURN** button to cancel the selection. Using the playback-related buttons, move to a point to split and press the **ENTER** button.


Split
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Split 1
Split 2
00:00:00
00:00:00
③
①
00:15:35
②
Select
Split
Return
MOVE SELECT RETURN EXIT

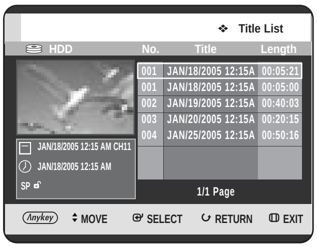
① First split interval
② Total recording time of title list
③ Start time of the second split and its screen


Split
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Split 1
Split 2
00:00:00
00:05:21
00:05:21
Select
Split
Return
MOVE SELECT RETURN EXIT

6 Press the **ENTER** button to select **Split**.
The message “This title cannot be recovered after splitting. Do you want to split?” is displayed.


This title cannot be recovered after spliting
Do you want to split?
Split
Yes
No
MOVE SELECT RETURN EXIT

7 Press the ◀ ▶ buttons to select **Yes**, then press the **OK** button.
The split title is divided into two, and next titles will be pushed back one by one.


Title List
HDD
No. Title Length
001 JAN/18/2005 12:15A 00:05:21
001 JAN/18/2005 12:15A 00:05:00
002 JAN/19/2005 12:15A 00:40:03
003 JAN/20/2005 12:15A 00:20:15
004 JAN/25/2005 12:15A 00:50:16
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page
Anykey MOVE SELECT RETURN EXIT

Deleting a Section of a Title (Partial Delete)

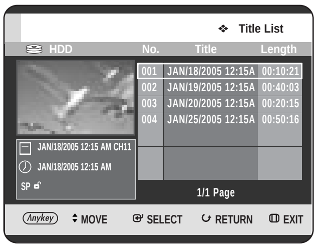
Follow these instructions to delete a section of a Title List entry.

HDD DVD-RAM DVD-RW

(VR mode)

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.

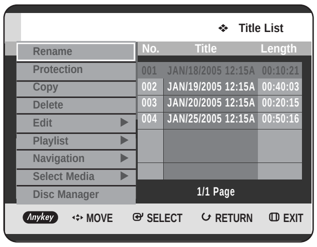

Title List
HDD
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

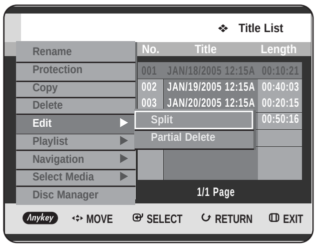
2 Press the ▲▼ buttons to select an entry you want to edit from the Title List, then press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

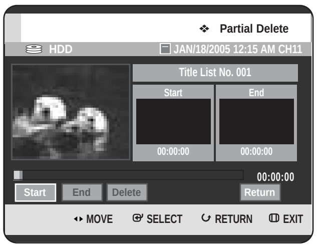
- When using DVD-RAM/-RW(VR) disc, you can select Partial Delete directly by pressing the ANYKEY button.
(Then go to step 5)

3 Press the ▲▼ buttons to select **Edit**, then press the **ENTER** or ▶ button.

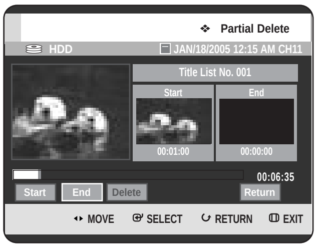

Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Split
Partial Delete
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
		00:50:16

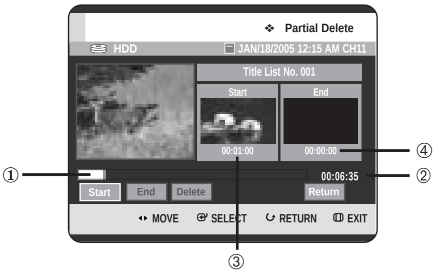
4 Press the ▲▼ buttons to select **Partial Delete**, then press the **ENTER** or ▶ button.


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Start
End
00:00:00
00:00:00
00:00:00
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

5 Press the **ENTER** button at the starting point.
The image and starting point time are displayed in the section deletion starting point window.


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Start
End
00:01:00
00:00:00
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

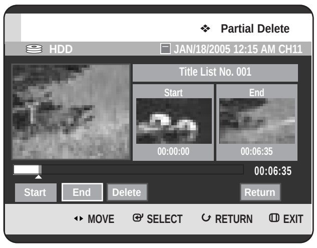
Edit Title List Screen Elements


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Start
End
00:01:00
00:00:00
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT
①
②
③
④

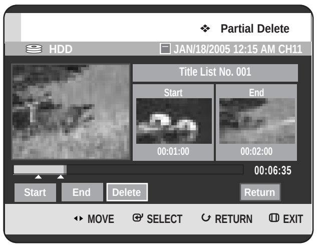
① Playback bar
② Playtime
③ Section deletion starting point window and time
④ Section deletion end point window and time
- Select the start and end points of the section you want to delete using the playback related buttons.
- Playback related buttons :
  (**PLAY(⏯)**, **SEARCH (⏪ ⏩)**)

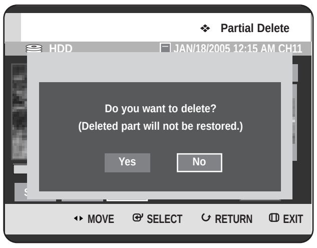
---

6 Press the **ENTER** button at the end point.
The image and end point time are displayed in the Section deletion ending point window.


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Start
End
00:00:00
00:06:35
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT

7 Press the ◀ ▶ buttons to select **Delete**, then press the **ENTER** button.


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Title List No. 001
Start
End
00:01:00
00:02:00
00:06:35
Start
End
Delete
Return
MOVE
SELECT
RETURN
EXIT


Partial Delete
HDD
JAN/18/2005 12:15 AM CH11
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete?
(Deleted part will not be restored.)

8 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button. The selected section has been deleted.

9 Press the ◀ ▶ buttons to select **Return**, then press the **ENTER** button to finish the operation.

NOTE

- The length of the section to be deleted must be at least 5 seconds long.
- If the length of the section to be deleted is less than 5 seconds, you will be prompted with the message “The range is too short.”.
- If the end time precedes the starting time, you will be prompted with the message “End point cannot be marked earlier than start point”.
- The section cannot be deleted when it includes a still picture.
- Press the **MENU** button after the operation has finished.
  The Title List screen will disappear.

Advanced Editing (Playlist)

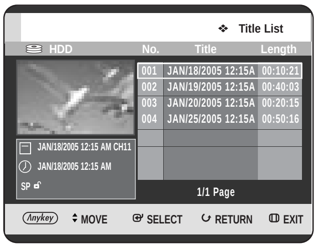
Creating a Playlist

Follow these instructions to create a new playlist entry from a recorded title.

HDD DVD-RAM DVD-RW
(VR mode)

Using the TITLE LIST button

1 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


Title List
HDD
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

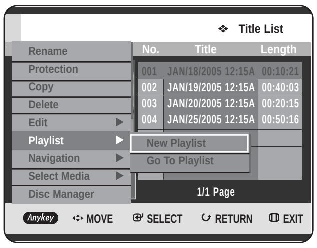
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP

Using the MENU button.

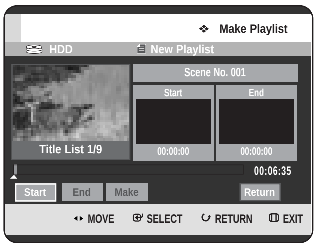
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.

2 Press the **ANYKEY** button.
Press the ▲▼ buttons to select **Playlist**, then press the **ENTER** or ▶ button.

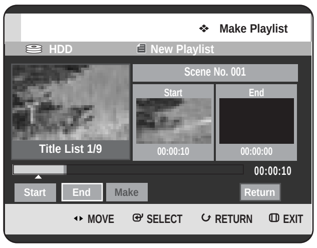

Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
New Playlist
Go To Playlist
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **New Playlist**, then press the **ENTER** or ▶ button.
The Make Playlist screen is displayed.

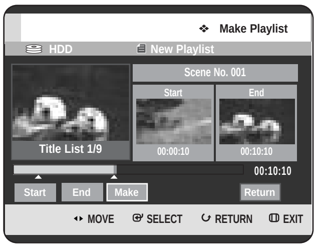

Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:00
00:00:00
00:06:35
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

4 Press the **ENTER** button at the start point.


Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:10
00:00:00
00:00:10
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

- The image and time at the start point are displayed on the Start window.
- The yellow-colored selection bar moves to the End item.
- Select the starting point of the section from which you want to create a new scene using the playback related buttons (**PLAY(**⏯**)**, **SEARCH (**⏪⏩**)**).

5 Press the **ENTER** button at the end point.


Make Playlist
HDD
New Playlist
Scene No. 001
Start
End
Title List 1/9
00:00:10
00:10:10
00:10:10
Start
End
Make
Return
MOVE
SELECT
RETURN
EXIT

- The image and end point time are displayed in the End window.
- The yellow-colored selection bar moves to the Make item.

6 Press the ◀ ▶ buttons to select **Make**, then press the **ENTER** button.

- To make a scene for playlist.
  A new Make scene screen is displayed.
  Repeat steps 3~6 to make scene of playlist.
  New scene will be added to the current playlist.
  You can check and see all the scenes on Edit playlist screen. (See page 101)
- To make a new playlist.
  Repeat steps 1~6 if you want to make a new playlist.

7 Press the ◀ ▶ button to select **Return**, then press the **ENTER** button for finishing the operation.

NOTE

- You can create up to 99 playlist entries.
- Depending on the kind of disc, the displayed screen may have a slight difference.
- Pressing the **SKIP** button will skip to the next title.

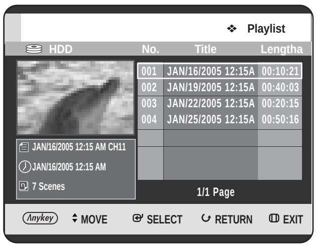
Playing Entries in the Playlist

Follow these instructions to play the playlist entries.

HDD DVD-RAM DVD-RW
(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Playlist screen is displayed.



❖ Playlist

No.	Title	Lengtha
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.
- Press the **ANYKEY** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **ENTER** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the playlist you want to play, then press the **ENTER** or **PLAY (⏯)** button.

3 Press the **STOP (⏹)** button to stop playing.
The screen returns to the Playlist screen.

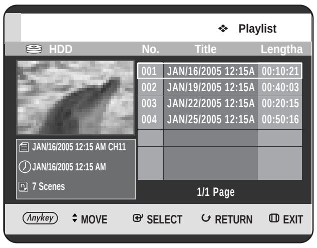
Renaming a Playlist Entry

Follow these instructions to rename a playlist entry, i.e. to edit the title of a playlist entry.

HDD DVD-RAM DVD-RW
(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.

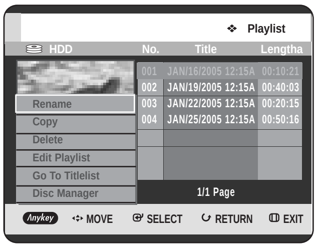

Playlist
HDD
JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Lengtha
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

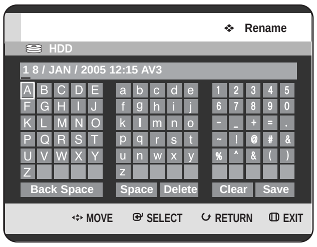
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.
- Press the **ANYKEY** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **ENTER** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to Rename from the Playlist, then press the **ANYKEY** button.
ANYKEY menu is displayed : **Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**


Playlist
HDD
Rename
Copy
Delete
Edit Playlist
Go To Titlelist
Disc Manager
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

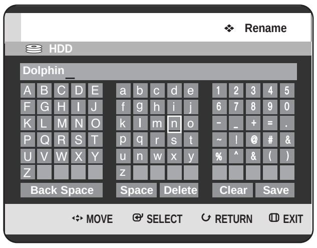
No.	Title	Lengtha
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Rename**, then press the **ENTER** or ▶ button.
The Rename screen is displayed.


Rename
HDD
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z
a b c d e
f g h i j
k l m n o
p q r s t
u n w x y
z
1 2 3 4 5
6 7 8 9 0
- _ + = .
~ ! @ # &
% ^ & ( )
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

1 8 / JAN / 2005 12:15 AV3

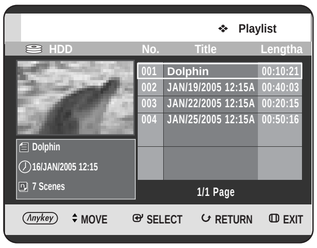
4 Select the desired characters using the ▲▼ ◀ ▶ buttons, then press the **ENTER** button.


Rename
HDD
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z
a b c d e
f g h i j
k l m n o
p q r s t
u n w x y
z
1 2 3 4 5
6 7 8 9 0
- _ + = .
~ ! @ # &
% ^ & ( )
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

Dolphin_

- This function is the same as the Rename function in the renaming the title. (See page 91)
- The maximum number of characters that can be entered is 31. All 31 characters can be displayed by pressing the **INFO** button.

5 Press the ▲▼ ◀ ▶ buttons to select **Save**, then press the **ENTER** button.
The changed title is displayed in the title field of the selected playlist entry.


Playlist
HDD
Dolphin
16/JAN/2005 12:15
7 Scenes
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Lengtha
001	Dolphin	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

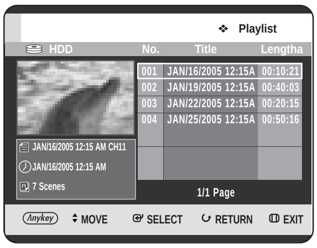
Editing a Scene for the Playlist

Follow these instructions to edit scenes for a playlist.

HDD DVD-RAM DVD-RW
(VR mode)

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.

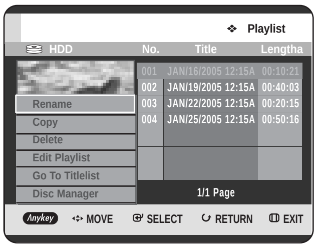

Playlist
HDD
JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes
1/1 Page
Anykey MOVE SELECT RETURN EXIT

No.	Title	Length
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

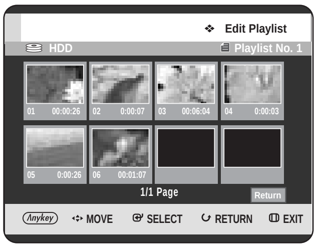
- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.
- Press the **ANYKEY** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **ENTER** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to edit from the Playlist, then press the **ANYKEY** button.
The Edit Playlist menu is displayed: **Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**.


Playlist
HDD
Rename
Copy
Delete
Edit Playlist
Go To Titlelist
Disc Manager
1/1 Page
Anykey MOVE SELECT RETURN EXIT

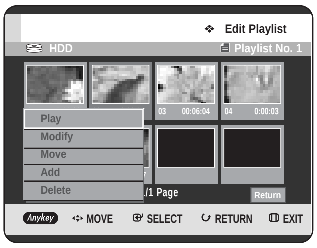
No.	Title	Length
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

3 Press the ▲▼ buttons to select **Edit Playlist**, then press the **ENTER** or ▶ button.
The Edit Playlist Scene screen is displayed.


Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 0:00:07
03 00:06:04
04 0:00:03
05 0:00:26
06 00:01:07
1/1 Page
Return
Anykey MOVE SELECT RETURN EXIT

Playing a Selected Scene

4 Press the ▲▼◀ ▶ buttons to select the scene you want to play, then press the **ANYKEY** button.
The playlist entry to be played is selected.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
1/1 Page
Return
Anykey MOVE SELECT RETURN EXIT

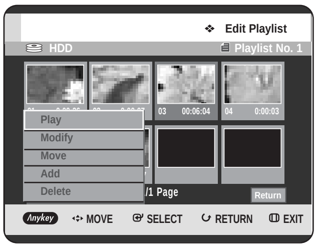
5 Press the ▲▼ buttons to select **Play**, then press the **ENTER** or ▶ button.
The selected scene is played.

- To stop scene play, press the **STOP** (⊡) button.

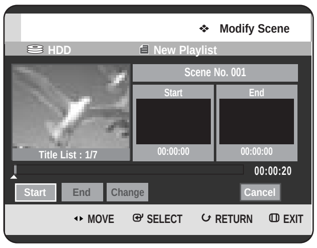
Modifying a Scene (Replacing a Scene)

To setup, follow steps 1 to 3 in page 101.

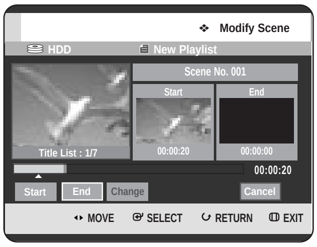
4 Press the ▲▼ ◀ ▶ buttons to select the scene you want to modify, then press the **ANYKEY** button.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Modify**, then press the **ENTER** or ▶ button.
The Modify Scene screen is displayed.

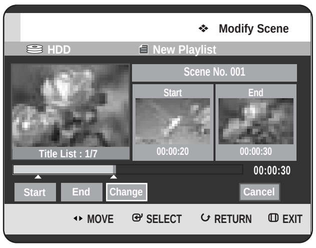

Modify Scene
HDD
New Playlist
Scene No. 001
Start
End
Title List : 1/7
00:00:00
00:00:00
00:00:20
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

6 Press the **ENTER** button at the start point of the scene.


Modify Scene
HDD
New Playlist
Scene No. 001
Start
End
Title List : 1/7
00:00:20
00:00:00
00:00:20
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

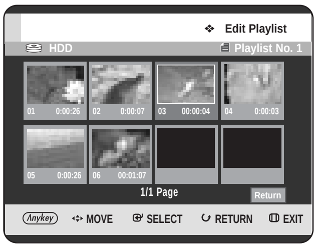
- The image and starting point time are displayed on the Start window.
- Select the starting or ending point of the section you want to modify using the playback related buttons (**PLAY(⏯)**, **SEARCH (⏪ ⏩)**).

7 Press the **ENTER** button at the end point of the scene.


Modify Scene
HDD
New Playlist
Scene No. 001
Start
End
Title List : 1/7
00:00:20
00:00:30
00:00:30
Start
End
Change
Cancel
MOVE
SELECT
RETURN
EXIT

- The image and ending point time are displayed in the End window.

8 Press the ◀ ▶ buttons to select **Change**, then press the **ENTER** button.

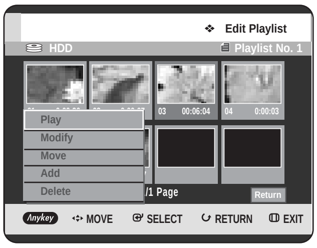

Edit Playlist
HDD
Playlist No. 1
01 0:00:26
02 0:00:07
03 00:00:04
04 0:00:03
05 0:00:26
06 00:01:07
1/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

- The scene you want to modify is changed with the selected section.

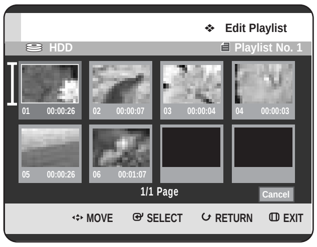
Moving a Scene (Changing the Position of a Scene)

To setup, follow steps 1 to 3 in page 101.

4 Press the ▲▼ ◀ ▶ buttons to select the scene you want to move (change the position), then press the **ANYKEY** button.

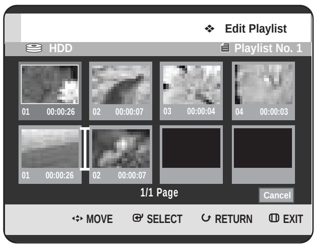

Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
1/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Move**, then press the **ENTER** or ▶ button.

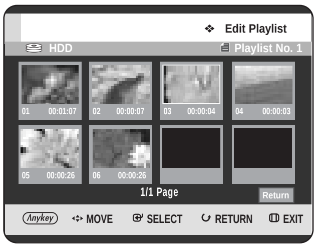

Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
05 00:00:26
06 00:01:07
1/1 Page
Cancel
MOVE
SELECT
RETURN
EXIT

- A yellow selection window is displayed on the scene to be moved.

6 Press the ▲▼ ◀ ▶ buttons to select the position to which you want to move the selected scene, then select the **ENTER** button.


Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
01 00:00:26
02 00:00:07
1/1 Page
Cancel
MOVE
SELECT
RETURN
EXIT

- The selected scene is moved to the selected position.


Edit Playlist
HDD
Playlist No. 1
01 00:01:07
02 00:00:07
03 00:00:04
04 00:00:03
05 00:00:26
06 00:00:26
1/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

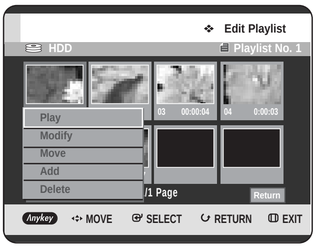
NOTE

- You cannot move the selected scene to the position of the next scene, because the selected scene should be inserted before that position, which requires no action.
- Depending on the kind of disc, the displayed screen may have a slight difference.

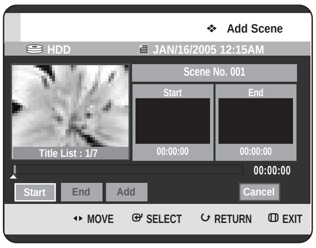
Adding a Scene

To setup, follow steps 1 to 3 in page 101.

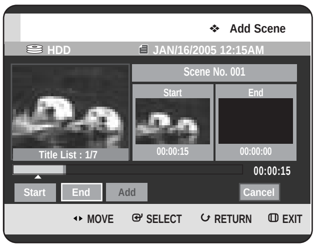
4 Press the ▲▼◀▶ buttons to select the scene that will have a new scene inserted before it, then press the **ANYKEY** button.


Edit Playlist
HDD
Playlist No. 1
03 00:00:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Add**, then press the **ENTER** or ▶ button.
The Add Scene screen is displayed.

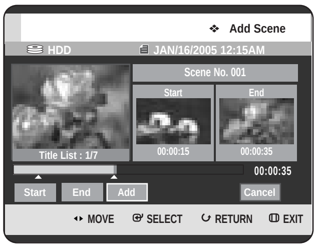

Add Scene
HDD
JAN/16/2005 12:15AM
Scene No. 001
Start
End
Title List : 1/7
00:00:00
00:00:00
00:00:00
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

6 Press the **ENTER** button at the starting point of the scene.


Add Scene
HDD
JAN/16/2005 12:15AM
Scene No. 001
Start
End
Title List : 1/7
00:00:15
00:00:00
00:00:15
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

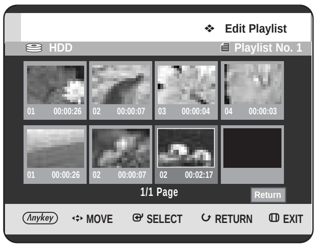
- The image and starting point time are displayed on the Start window.
- Select the starting or ending point of the section you want to modify using the playback related buttons (**PLAY(⏯)**, **SKIP (⏮ ⏭)**).

7 Press the **ENTER** button at the end point of the scene.


Add Scene
HDD
JAN/16/2005 12:15AM
Scene No. 001
Start
End
Title List : 1/7
00:00:15
00:00:35
00:00:35
Start
End
Add
Cancel
MOVE
SELECT
RETURN
EXIT

- The image and time of the end point are displayed in the End window.
- To cancel, press the ◀▶ buttons to select **Cancel**, then press the **ENTER** button.

8 Press the ◀▶ buttons to select **Add**, then press the **ENTER** button.

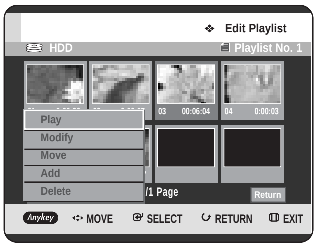

Edit Playlist
HDD
Playlist No. 1
01 00:00:26
02 00:00:07
03 00:00:04
04 00:00:03
01 00:00:26
02 00:00:07
02 00:02:17
1/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

- The section you want to add is inserted prior to the scene selected in step 4 of Adding a Scene on the previous page.

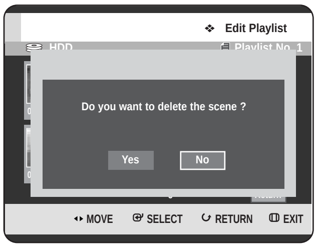
Deleting a Scene

To setup, follow steps 1 to 3 in page 101.

4 Press the ▲▼ ◀ ▶ buttons to select the scene you want to delete, then press the **ANYKEY** button.


Edit Playlist
HDD
Playlist No. 1
03 00:06:04
04 0:00:03
Play
Modify
Move
Add
Delete
/1 Page
Return
Anykey
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.


Do you want to delete the scene ?
Edit Playlist
Yes
No
MOVE
SELECT
RETURN
EXIT

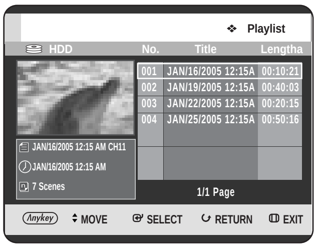
- The message “Do you want to delete the scene ?” is displayed.

6 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** to delete the selected scene.

Deleting a Playlist Entry from the Playlist

Using the PLAY LIST button

1 With the unit in Stop mode/Playback mode, press the **PLAY LIST** button.
The Edit Playlist screen is displayed.



No.	Title	Lengtha
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

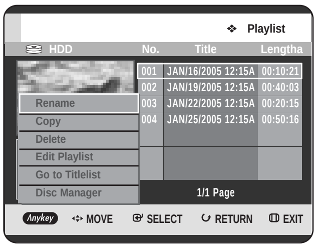
JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes

Playlist
HDD
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.
- Press the **ANYKEY** button.
- Press the ▲▼ buttons to select **Playlist**, then press the **ENTER** or ▶ button.
- Press the ▲▼ buttons to select **Go To Playlist**, then press the **ENTER** or ▶ button.

2 Press the ▲▼ buttons to select the title you want to edit from the Playlist, then press the **ANYKEY** button.
The Edit Playlist menu is displayed:**Rename**, **Copy**, **Delete**, **Edit Playlist**, **Go To Titlelist**, **Disc Manager**.

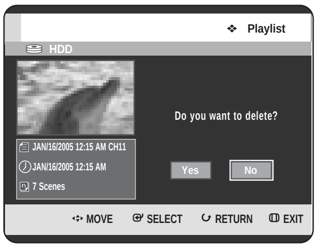


No.	Title	Lengtha
001	JAN/16/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/22/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Playlist
HDD
Rename
Copy
Delete
Edit Playlist
Go to Titlelist
Disc Manager
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.

- You will be prompted with the delete confirmation message “Do you want to delete?”.

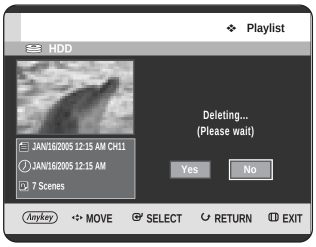

Playlist
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes

Do you want to delete?

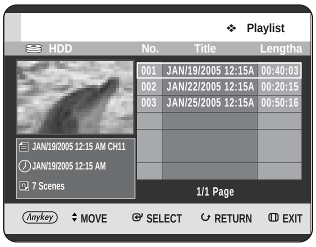
---

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
You automatically returned to the Playlist screen after the delete operation has finished.


Playlist
HDD
Yes
No
Anykey
MOVE
SELECT
RETURN
EXIT

JAN/16/2005 12:15 AM CH11
JAN/16/2005 12:15 AM
7 Scenes

Deleting...
(Please wait)

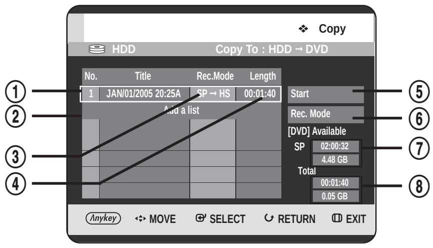

Playlist
HDD
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

JAN/19/2005 12:15 AM CH11
JAN/19/2005 12:15 AM
7 Scenes

No.	Title	Lengtha
001	JAN/19/2005 12:15A	00:40:03
002	JAN/22/2005 12:15A	00:20:15
003	JAN/25/2005 12:15A	00:50:16

Copying from HDD to DVD

About the Copy Screen


①
②
③
④
⑤
⑥
⑦
⑧
Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/01/2005 20:25A	SP → HS	00:01:40

[DVD] Available
SP 02:00:32
4.48 GB
Total
00:01:40
0.05 GB

① Title to be copied
② Add titles to be copied (up to 7 titles can be copied at one time)
③ Recording mode for copying
- HS(high speed): you can copy more quickely than normal playback speed.
  Copies in the same record mode as source title.
- XP/SP/LP/EP : you can not use high speed copy.

④ Record time of title to be copied
⑤ Copy start button
⑥ Record mode setup button
⑦ Remaining time and space on the current disc in DVD Record mode
⑧ Total record time and space of selected titles for copying

Contents Copy Specifications

Contents	HDD → DVD
Recorded Video Title	Supported
Copy Protected Title	Not supported
Copy Once Title	Move (Deletes the Title in the HDD after copying)

Once “Copy Once program” has been recorded on the DVD disc, this title cannot be copied to HDD anymore.
But “Copy Once program” has been recorded on the HDD, this title can be copied to DVD-RW(VR mode) or DVD-RAM.

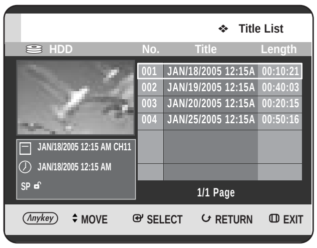
Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

3 Select the HDD by pressing the **HDD** button on the front panel of the HDD & DVD RECORDER or on the remote control.

4 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


❖ Title List
HDD
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.

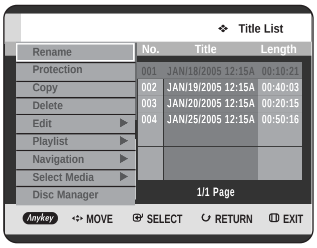
5 Press the ▲▼ buttons to select the title you want to copy.

To move to other pages, press the **SKIP(⏮ ⏭)** buttons.

SKIP(⏮) : previous page of title list

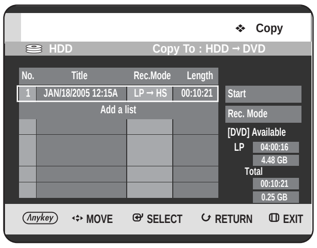
SKIP(⏭) : next page of title list

6 Press the **ANYKEY** button.


❖ Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

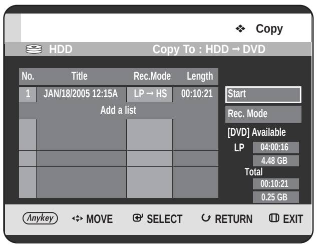
7 Press the ▲▼ buttons to select **Copy**, then press the **ENTER** or ▶ button.
The Copy screen is displayed.


❖ Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21

- If you want to change the record mode when copying, see page 112.

8 Press the **ENTER** or ▶ button to select **Start**, then press the **ENTER** button.


❖ Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21

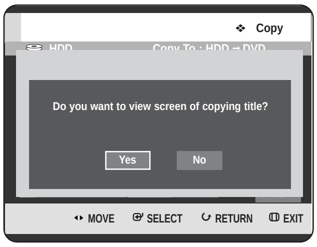
- About Using COPY button -

Press the ▲▼ buttons to select title you want to copy from the title list and then press the **COPY** button on the remote control. You can go to the copy screen.

- During the Playback, you can also copy the title by pressing the **COPY** button.

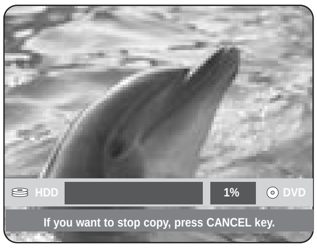
- Copying a Title that has been edited once before -

9 The “Do you want to view screen of copying title?” message is displayed.



Do you want to view screen of copying title?

10 To copy a title while viewing the title on the copy screen, press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.

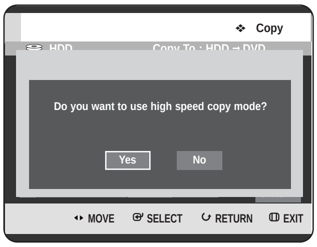


If you want to stop copy, press CANCEL key.

- If **No** is selected, the title to be copied is not displayed screen, and copying begins while the currently broadcasting program is displayed on the screen.
- To cancel the copying in progress, press the **CANCEL** button.

- Copying an Unedited title -

9-1 The “Do you want to use high speed copy mode?” message is displayed.

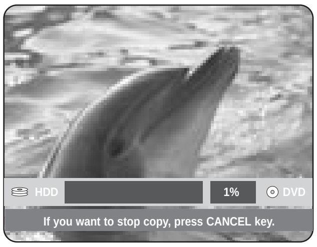


Do you want to use high speed copy mode?

NOTE

- High speed copy : This means that you can transfer without having to worry about the quality getting worse with each copy ‘generation’. It also means that copying can be carried out at the maximum speed possible.

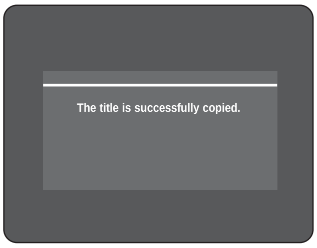
10-1 To begin high speed copy, press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
High speed copy begins. The title to be copied is not played back, while the currently broadcasting program is displayed on the screen.



If you want to stop copy, press CANCEL key.

- If **No** is selected, the title to be copied is displayed at its playback speed while copying.
- To cancel the copying in progress, press the **CANCEL** button.

11-1 After a successful copy, “The title is successfully copied” message is displayed.

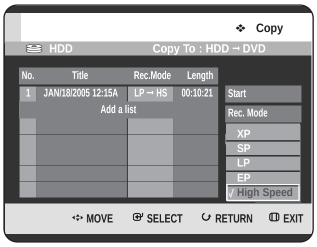


The title is successfully copied.

Changing the Record Mode

To setup, follow steps 1 to 7 in page 107.

8 Press the ▶ and ▼ buttons to select **Rec. Mode**, then press the **ENTER** button.



No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
	Add a list		

9 Press the ▲▼ buttons to select record mode you want to record, then press the **ENTER** button.

- HS(High Speed) : Copies in the same record mode as HDD.
- XP/SP/LP/EP : You cannot copy the higher quality mode than original. If the same record mode is selected, the title is copied at high speed.

NOTE

- Using the same method, you can copy a Playlist.
- High speed copying is not available for a title list that has been deleted partially.
- During copying, timer recording is not available.
- High speed copying is not available when:
  - Copying a title that can only be copied once
  - Copying a playlist
  - Copying a partially-deleted title
- Regarding title lists that can be copied only once:
  - Only available for DVD discs that support CPRM.
  - If a playlist contains a scene that can only be copied once, it cannot be copied.

Copying Multiple Titles at One Time

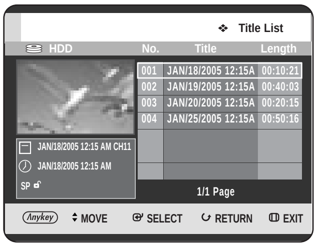
Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

3 Select the HDD by pressing the **HDD** button on the front panel of the HDD & DVD RECORDER or on the remote control.

4 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.



No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

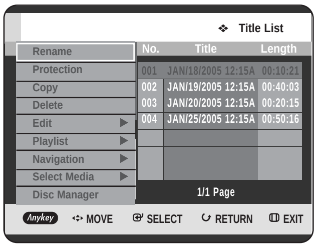
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.

5 Press the ▲▼ buttons to select one of the title you want to copy.
To move to other pages, press the **SKIP (⏮ ⏭)** buttons.
SKIP(⏮) : previous page of title list
SKIP(⏭) : next page of title list

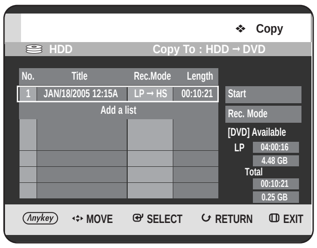
6 Press the **ANYKEY** button.


Title List
Rename
Protection
Copy
Delete
Edit
Playlist
Navigation
Select Media
Disc Manager
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

1/1 Page

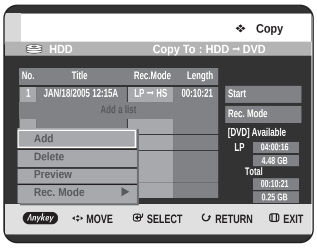
7 Press the ▲▼ buttons to select **Copy**, then press the **ENTER** or ▶ button.
The Copy screen is displayed.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB

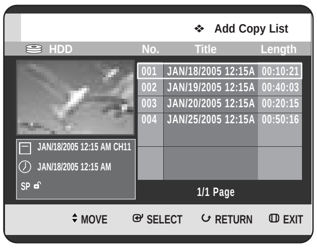
8 Press the **ANYKEY** button.


Copy
HDD
Copy To : HDD → DVD
Add a list
Add
Delete
Preview
Rec. Mode
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:10:21
0.25 GB

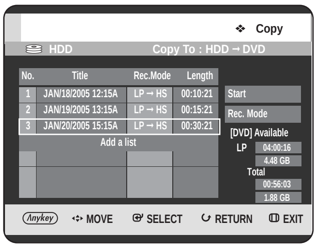
9 Press the ▲▼ buttons to select **Add**, then press the **ENTER** button.
The Add Copy List screen is displayed.
Press the ▲▼ buttons to select you want to copy, then press the **ENTER** button.
Other method: Press the ▲▼ buttons to select **Add a list**, then press the **ENTER** button.
Press the ▲▼ buttons to select you want to copy, then press the **ENTER** button.


Add Copy List
HDD
SP
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
1/1 Page

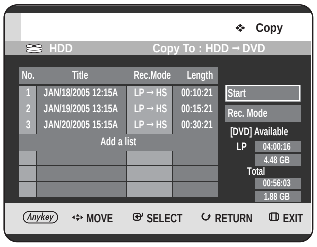
10 Repeat steps 8~9 to select a title you want to copy.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	LP → HS	00:15:21
3	JAN/20/2005 15:15A	LP → HS	00:30:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

11 Press the **ENTER** or ▶ buttons to select **Start**, then press the **ENTER** button.


Copy
HDD
Copy To : HDD → DVD
Add a list
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	LP → HS	00:15:21
3	JAN/20/2005 15:15A	LP → HS	00:30:21

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

The added title lists into the copy list are copied.
To cancel the copying in progress, press the **CANCEL** button.

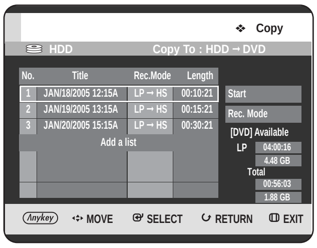
NOTE

- If copy list contains at least one title that cannot be copied at high speed, it performs the step 9 described on page108. Otherwise, it performs the step 9^{-1} described on page 108.

Deleting an Undesired Title from the Copy List

To setup, follow steps 1 to 7 in pages 109~110.

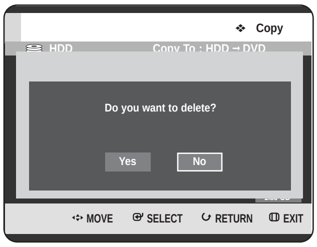
8 Press the ▲▼ buttons to select a title you want to delete from the copy screen.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	LP → HS	00:15:21
3	JAN/20/2005 15:15A	LP → HS	00:30:21
	Add a list		

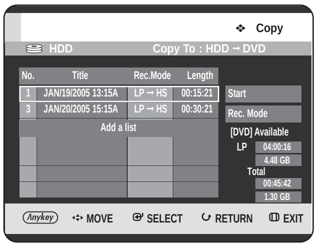
[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **ANYKEY** button. Press the ▲▼ buttons to select **Delete**, then press the **ENTER** or ▶ button.
The message "Do you want to delete?" is displayed.


Copy
HDD
Copy To : HDD → DVD
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete?

10 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
The selected title is deleted.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

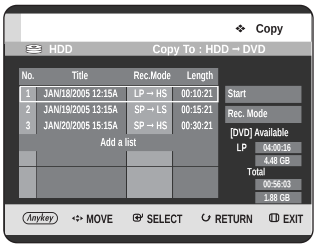
No.	Title	Rec.Mode	Length
1	JAN/19/2005 13:15A	LP → HS	00:15:21
3	JAN/20/2005 15:15A	LP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:45:42
1.30 GB

Previewing a Selected Title from the Copy List

To setup, follow steps 1 to 7 in pages 109~110.

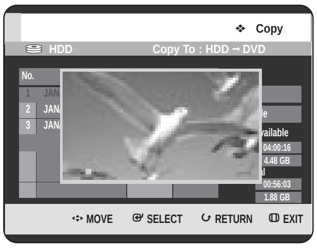
8 Press the ▲▼ buttons to select a title you want to preview in the copy screen.


Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	SP → LS	00:15:21
3	JAN/20/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **ANYKEY** button. Press the ▲▼ buttons to select **Preview**, then press the **ENTER** or ▶ button.
You can preview the selected title through the display window located at the center of the screen.


Copy
HDD
Copy To : HDD → DVD
No.
MOVE
SELECT
RETURN
EXIT

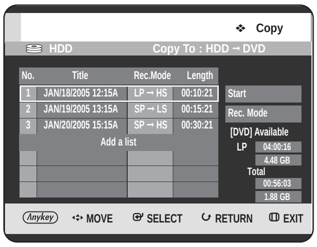
10 Press the **RETURN** button to exit the Preview mode.

Selecting Record Mode of Each Title from the Copy List.

You can copy multiple titles while setting different record modes for each title.

To setup, follow steps 1 to 7 in pages 109~110.

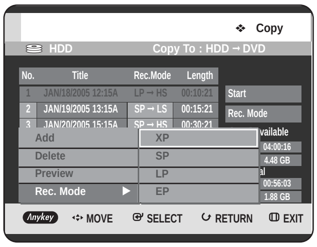
8 Press the ▲▼ buttons to select a title to change its record mode in the copy screen.


❖ Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	SP → LS	00:15:21
3	JAN/20/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

9 Press the **ANYKEY** button. Press the ▲▼ buttons to select **Rec. Mode**, then press the **ENTER** or ▶ button.


❖ Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Add
Delete
Preview
Rec. Mode ▶
XP
SP
LP
EP
Anykey
MOVE
SELECT
RETURN
EXIT

10 Press the ▲▼ buttons to select the record mode you want, then press the **ENTER** or ▶ button.

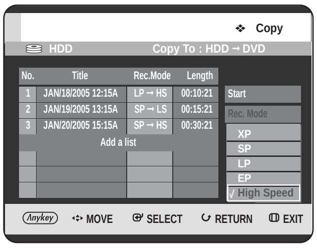
11 Repeat steps 9~11 to select a title to change it's record mode.
Rest of the copying process can be performed as described in page 107 to 108.

Changing Record Mode of All Titles from the Copy List

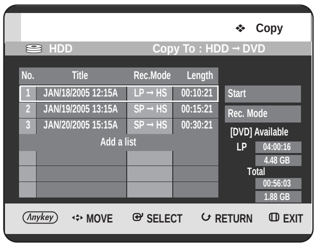
You can copy multiple titles while setting the same record mode for all titles.

To setup, follow steps 1 to 7 in pages 109~110.

8 Select the **Rec. Mode** on the right-hand side on the screen using the ▲▼◀ ▶ buttons, then press the **ENTER** button.


❖ Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
XP
SP
LP
EP
√ High Speed
Anykey
MOVE
SELECT
RETURN
EXIT

9 Press the ▲▼ buttons to select the record mode you want, then press the **ENTER** button.
Rest of the copying process can be performed as described in page 107 to 108.


❖ Copy
HDD
Copy To : HDD → DVD
Start
Rec. Mode
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21
2	JAN/19/2005 13:15A	SP → HS	00:15:21
3	JAN/20/2005 15:15A	SP → HS	00:30:21
	Add a list		

[DVD] Available
LP 04:00:16
4.48 GB
Total
00:56:03
1.88 GB

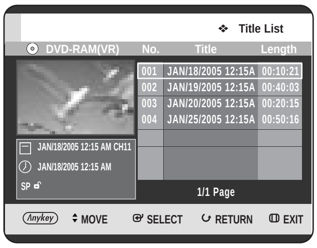
Copying from DVD to HDD

Using the TITLE LIST button

1 Press the **OPEN/CLOSE** button and place a recordable disc on the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray.

3 With the unit in Stop mode/Playback mode, press the **TITLE LIST** button.
The Title List screen is displayed.


❖ Title List
DVD-RAM(VR)
JAN/18/2005 12:15 AM CH11
JAN/18/2005 12:15 AM
SP
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

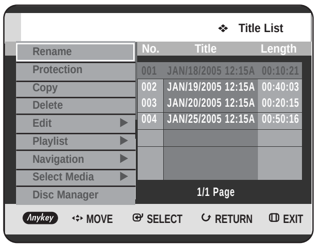
No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

Using the MENU button.

- With the unit in Stop mode/Playback mode, press the **MENU** button.
- Press the ▲▼ buttons to select **Title**, then press the **ENTER** or ▶ button.
  The Title List screen is displayed.

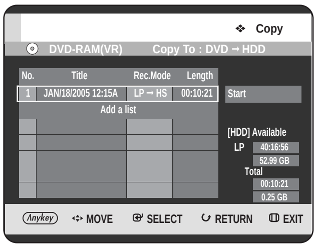
4 Press the ▲▼ buttons to select the title you want to copy.
To move to other pages, press the **SKIP (⏮ ⏭)** buttons.
SKIP(⏮) : previous page of title list
SKIP(⏭) : next page of title list

5 Press the **ANYKEY** button.


❖ Title List
Rename
Protection
Copy
Delete
Edit ▶
Playlist ▶
Navigation ▶
Select Media ▶
Disc Manager
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Length
001	JAN/18/2005 12:15A	00:10:21
002	JAN/19/2005 12:15A	00:40:03
003	JAN/20/2005 12:15A	00:20:15
004	JAN/25/2005 12:15A	00:50:16

6 Press the ▲▼ buttons to select **Copy**, then press the **ENTER** or ▶ button.
The Copy screen is displayed.


❖ Copy
DVD-RAM(VR)
Copy To : DVD → HDD
Add a list
Start
Anykey
MOVE
SELECT
RETURN
EXIT

No.	Title	Rec.Mode	Length
1	JAN/18/2005 12:15A	LP → HS	00:10:21

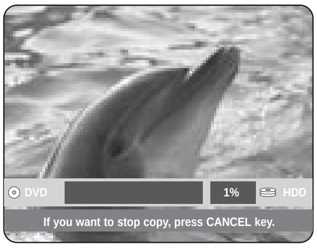
[HDD] Available
LP 40:16:56
52.99 GB
Total
00:10:21
0.25 GB

- About Using COPY button -

Press the ▲▼ buttons to select title you want to copy from the title list and then press the **COPY** button on the remote control. You can go to the copy screen.

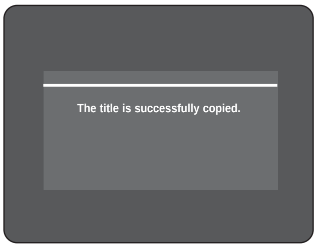
- During the Playback, you can also copy the title by pressing the **COPY** button.

7 Press the **ENTER** or ▶ buttons to select **Start**, then press the **ENTER** button.



If you want to stop copy, press CANCEL key.

8 After a successful copy, “The title is successfully copied.” message is displayed.



The title is successfully copied.

- Copying Multiple Titles at One Time – Same as an HDD operation(See page 109)
- Deleting an Undesired Title from the Copy List – Same as an HDD operation(See page 111)
- Previewing a Selected Title from the Copy List – Same as an HDD operation(See page 111)

NOTE

- You cannot copy anything else on finalized DVD-R and DVD-RW(V mode) mode.
- You cannot copy a DVD-VIDEO to HDD.
- Only video will be copied from title lists or playlist that contains still images.
- High speed copying from a DVD-RAM or DVD-RW (VR mode) is available.
- When you copy from DVD-RW(V mode)/-R disc to HDD, high speed copy is not available.
- Record mode cannot be changed when you copy a title from DVD to HDD.

Contents Copy Specifications

Contents	DVD ➞ HDD
Recorded Video Title	Supported
Copy Protected Title	Not supported
Copy Once Title	Not supported

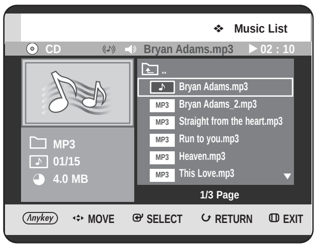
Copying MP3 or JPEG Files from a Disc to HDD

File Copy

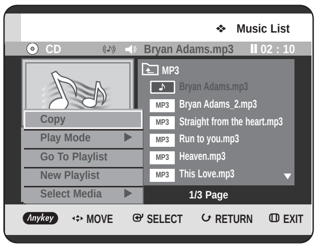
1 Insert a JPEG disc or MP3 disc into the disc tray.

2 Press the **OPEN/CLOSE** button to close the disc tray. Wait until **LOAD** disappears from the front panel display. Check that the disc has enough available space for the recording.

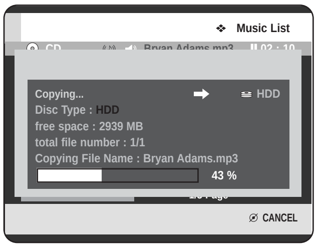
3 Press the ▲▼ buttons to select **Music** or **Photo**, then press the **ENTER** or ▶ button.
The MP3 or JPEG file list is displayed.


Music List
CD
Bryan Adams.mp3
▶ 02 : 10
..
Bryan Adams.mp3
MP3 Bryan Adams_2.mp3
MP3 Straight from the heart.mp3
MP3 Run to you.mp3
MP3 Heaven.mp3
MP3 This Love.mp3
MP3
01/15
4.0 MB
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select the MP3 or JPEG files you want to copy, then press the **ANYKEY** button.


Music List
CD
Bryan Adams.mp3
02 : 10
MP3
Bryan Adams.mp3
Bryan Adams_2.mp3
Straight from the heart.mp3
Run to you.mp3
Heaven.mp3
This Love.mp3
Copy
Play Mode
Go To Playlist
New Playlist
Select Media
1/3 Page
Anykey
MOVE
SELECT
RETURN
EXIT

5 Press the ▲▼ buttons to select **Copy**, then press the **ENTER** or ▶ button.
File copy begins.
The copying of only 1 file cannot be cancelled.
When copying only 1 file from a disc to HDD, it is located under the HDD's Music or Photo folder.

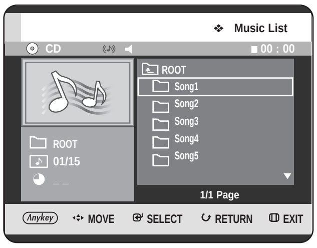

Music List
HDD
CANCEL

Copying...
Disc Type : HDD
free space : 2939 MB
total file number : 1/1
Copying File Name : Bryan Adams.mp3
43 %

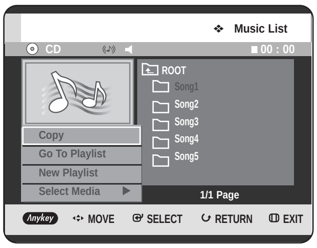
Folder Copy

1 Insert a Disc (JPEG or MP3) in to the tray.

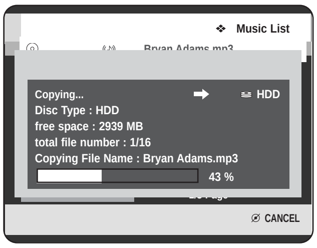
2 Press the ▲▼ buttons to select **Music** or **Photo**, then press the **ENTER** or ▶ button.
The MP3 or JPEG folder is displayed.


Music List
CD
00 : 00
ROOT
Song1
Song2
Song3
Song4
Song5
ROOT
01/15
_ _
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

3 Press the ▲▼ buttons to select the MP3 or JPEG folder you want to copy, then press the **ANYKEY** button.


Music List
CD
00 : 00
ROOT
Song1
Song2
Song3
Song4
Song5
Copy
Go To Playlist
New Playlist
Select Media
1/1 Page
Anykey
MOVE
SELECT
RETURN
EXIT

4 Press the ▲▼ buttons to select **Copy**, then press the **ENTER** or ▶ button.
Folder copy begins.
Subfolders and files in the selected folder are copied.


Music List
HDD
CANCEL

Copying...
Disc Type : HDD
free space : 2939 MB
total file number : 1/16
Copying File Name : Bryan Adams.mp3
43 %

NOTE

- Pressing the **CANCEL** button during folder copying will cancel the folder copying after the current file is copied.
- Up to 1,500 files and 1,000 subfolders can be copied into one folder for MP3 files.
- Up to 4,500 files and 1,000 subfolders can be copied into one folder for JPEG files.
- Files having an existing name of ***.mp3/***.jpg, is automatically renamed to ***01.mp3/***01.jpg and copied.
- It allows up to 999 copies to have the same name.
- You cannot copy an Audio CD.
- MP3 or JPEG files can be copied only from a disc to the HDD.
- The sizes of a file in a disc and the copied one in the HDD may be slightly different due to the file system.

Contents Copy Specifications

Contents	HDD → DVD	DVD → HDD
MP3	Not supported	supported
JPEG(photo)	Not supported	supported

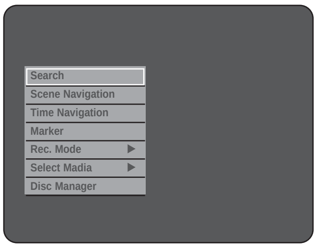
Disc Manager

Editing the Disc Name

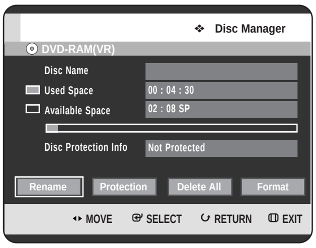
Follow these instructions to give a name to a disc.

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **ANYKEY** button.

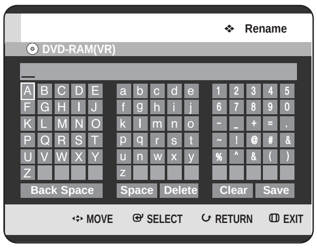

Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.

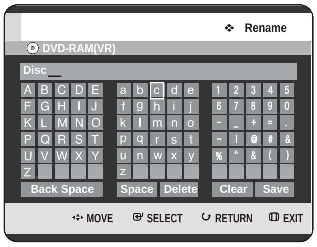

Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name
Used Space 00 : 04 : 30
Available Space 02 : 08 SP
Disc Protection Info Not Protected

3 Press the ◀ ▶ buttons to select **Rename**, then press the **ENTER** button.
The Rename screen is displayed.

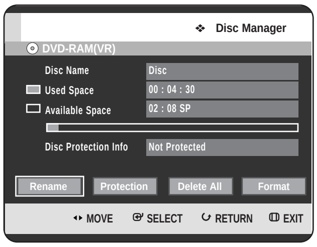

❖ Rename
DVD-RAM(VR)
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o - _ + = .
P Q R S T p q r s t ~ ! @ # &
U V W X Y u n w x y % ^ & ( )
Z z
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

4 Select the desired characters using the ▲▼ ◀ ▶ buttons, then press the **ENTER** button.


❖ Rename
DVD-RAM(VR)
A B C D E a b c d e 1 2 3 4 5
F G H I J f g h i j 6 7 8 9 0
K L M N O k l m n o - _ + = .
P Q R S T p q r s t ~ ! @ # &
U V W X Y u n w x y % ^ & ( )
Z z
Back Space
Space
Delete
Clear
Save
MOVE
SELECT
RETURN
EXIT

Disc__

5 Press the ▲▼ ◀ ▶ buttons to select **Save**, then press the **ENTER** button.
A disc name is given to the disc.


❖ Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name: Disc
Used Space: 00 : 04 : 30
Available Space: 02 : 08 SP
Disc Protection Info: Not Protected

NOTE

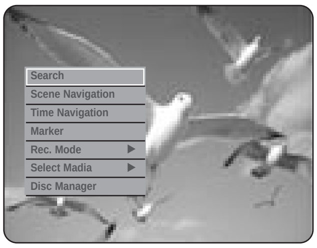
- You may need to clear disc protect before beginning editing.
- Depending on the kind of disc, the displayed screen may be different.

Disc Protection

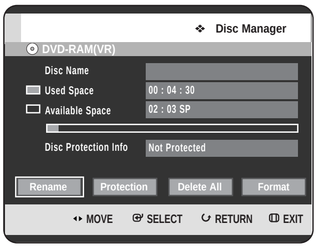
Disc Protection allows you to protect your discs from being formatted or deleted due to unintended operations.

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **ANYKEY** button.

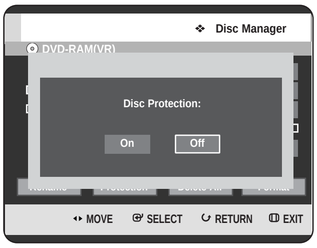

Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


❖ Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name:
Used Space: 00 : 04 : 30
Available Space: 02 : 03 SP
Disc Protection Info: Not Protected

3 Press the ◀ ▶ buttons to select **Protection**, then press the **ENTER** button.


❖ Disc Manager
DVD-RAM(VR)
Disc Protection:
On
Off
MOVE
SELECT
RETURN
EXIT

4 Press the ◀ ▶ buttons to select **On**, then press the **ENTER** button.

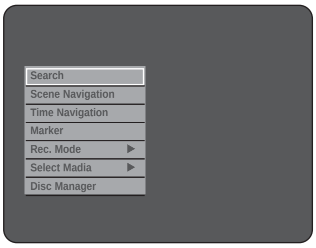
Editing

Formatting a Disc

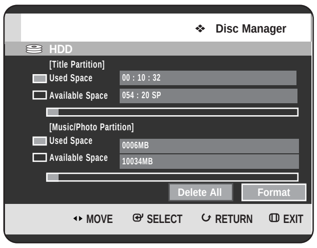
Use these instructions to format a disc.
The disc protect should also be cleared.

HDD DVD-RAM DVD-RW

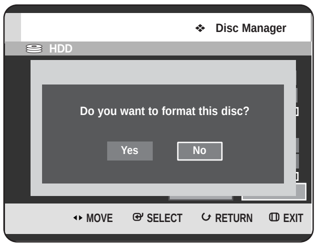
1 With the unit in Stop mode, press the **ANYKEY** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode
Select Madia
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


Used Space 00 : 10 : 32
Available Space 054 : 20 SP
Used Space 0006MB
Available Space 10034MB
Disc Manager
HDD
[Title Partition]
[Music/Photo Partition]
Delete All
Format
MOVE
SELECT
RETURN
EXIT

3 Press the ◀ ▶ buttons to select **Format**, then press the **ENTER** button.

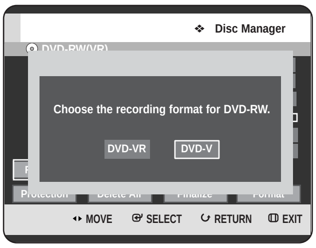

Do you want to format this disc?
Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

HDD/DVD-RAM

- You will be prompted with the confirmation message “Do you want to format this disc?”.
- If you select **Yes**, you will be prompted with the confirmation message “All data will be deleted. Do you want to continue?”.

DVD-RW

- You will be prompted with the confirmation message “Choose the recording format for DVD- RW.”


Choose the recording format for DVD-RW.
Disc Manager
DVD-VR
DVD-V
MOVE
SELECT
RETURN
EXIT

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button. The disc is formatted.

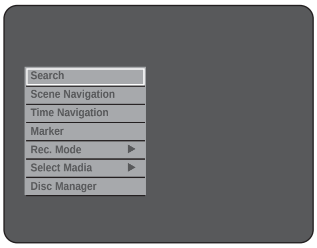
DVD-VR and DVD-V are defined according to their recording format.

	DVD-VR	DVD-V
DISC	DVD-RAM DVD-RW	DVD-RW DVD-R

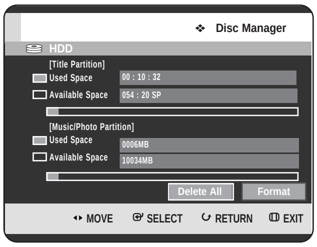
Delete All Title Lists/Music Lists/Photo Lists

HDD

1 With the unit in Stop mode, press the **ANYKEY** button.

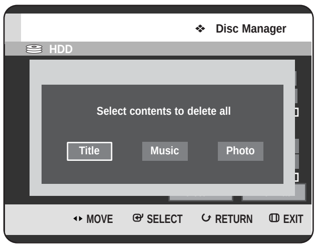

Search
Scene Navigation
Time Navigation
Marker
Rec. Mode
Select Madia
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


Disc Manager
HDD
Delete All
Format
MOVE
SELECT
RETURN
EXIT

[Title Partition]
Used Space 00 : 10 : 32
Available Space 054 : 20 SP
[Music/Photo Partition]
Used Space 0006MB
Available Space 10034MB

3 Press the ◀ ▶ buttons to select **Delete All**, then press the **ENTER** button.

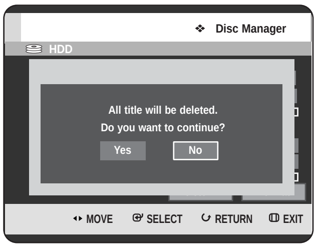

Disc Manager
HDD
Title
Music
Photo
MOVE
SELECT
RETURN
EXIT

Select contents to delete all

- When Protected Entry exists: The Delete All Title List function will not operate. If there is a title containing a still picture, however, that function will not operate. If you want to delete a protected entry, disable Protect for it on the Lock item.

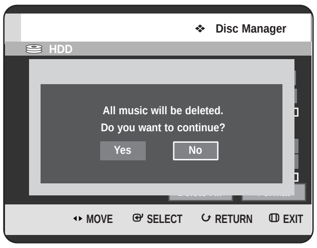
4 Press the ◀ ▶ buttons to select the **Title**, **Music** or **Photo**, then press the **ENTER** button.

Title


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

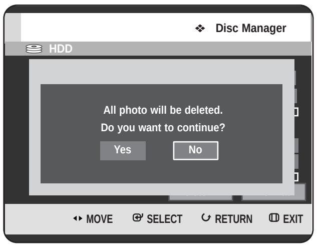
All title will be deleted.
Do you want to continue?

Music


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

All music will be deleted.
Do you want to continue?

Photo


Disc Manager
HDD
Yes
No
MOVE
SELECT
RETURN
EXIT

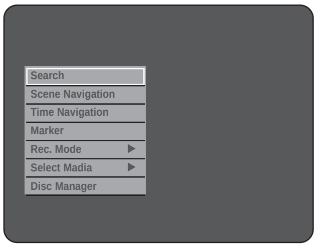
All photo will be deleted.
Do you want to continue?

5 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
All title lists, music list or photo lists are deleted.

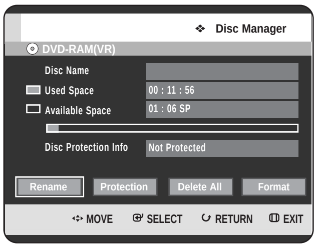
Delete All Title Lists

DVD-RAM DVD-RW DVD-R

1 With the unit in Stop mode, press the **ANYKEY** button.


Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


❖ Disc Manager
DVD-RAM(VR)
Rename
Protection
Delete All
Format
MOVE
SELECT
RETURN
EXIT

Disc Name

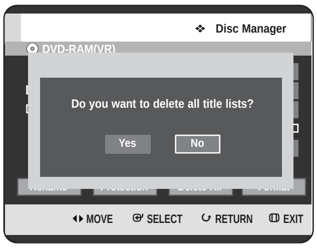
Used Space 00 : 11 : 56

Available Space 01 : 06 SP

Disc Protection Info Not Protected

3 Press the ◀ ▶ buttons to select **Delete All**, then press the **ENTER** button.

- You will be prompted with the confirmation message “Do you want to delete all title lists?”.


❖ Disc Manager
DVD-RAM(VR)
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to delete all title lists?

- When Protected Entry exists: The Delete All Title List function will not operate. If there is a title containing a still picture, however, that function will not operate.
  If you want to delete a protected entry, disable Protect for it on the Lock item.
- When protected a DVD-RAM is used, data cannot be deleted from a disc.

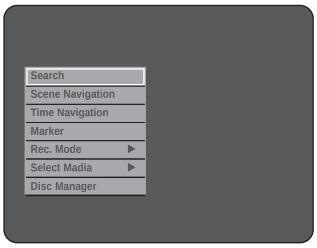
4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
All title lists are deleted.

Finalizing a Disc

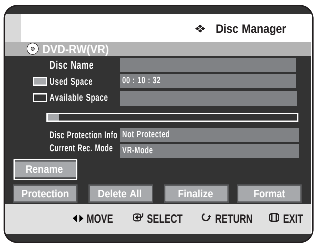
After you record titles onto a DVD-RW/DVD-R disc with your HDD & DVD RECORDER, it needs to be finalized before it can be played back on external devices.

DVD-RW DVD-R

1 With the unit in Stop mode, press the **ANYKEY** button.

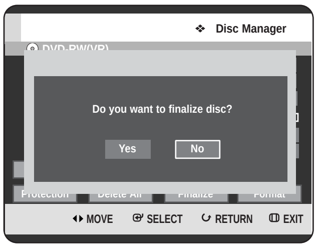

Search
Scene Navigation
Time Navigation
Marker
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


Disc Manager
DVD-RW(VR)
Rename
Protection
Delete All
Finalize
Format
MOVE
SELECT
RETURN
EXIT

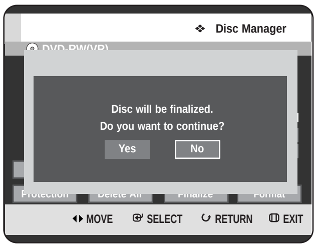
Disc Name
Used Space 00 : 10 : 32
Available Space
Disc Protection Info Not Protected
Current Rec. Mode VR-Mode

3 Press the ▲▼ buttons to select **Finalize**, then press the **ENTER** button.
You will be prompted with the message “Do you want to finalize disc?”.


Disc Manager
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to finalize disc?

If you select **Yes**, you will be prompted again with the message “Disc will be finalized. Do you want to continue?”.


Disc Manager
Yes
No
MOVE
SELECT
RETURN
EXIT

Disc will be finalized.
Do you want to continue?

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
The disc is finalized.

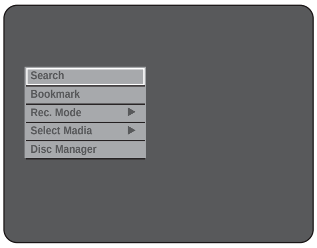
NOTE

- Once a disc is finalized, you cannot delete entries from the record list.
- After being finalized, the DVD-R/DVD-RW(video mode) operates in the same manner as a DVD-Video.
- Depending on the disc type, the displayed screen may be different.
- Finalizing time may be different depending on the amount of data recorded on the disc.
- Data on the disc will be damaged if the recorder is powered off during finalize process.
- When the disc contains a music or JPEG files, you cannot finalise the disc.

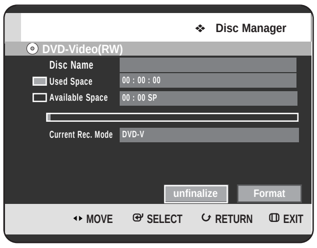
Unfinalizing a Disc (V/VR mode)

DVD-RW

1 With the unit in Stop mode, press the **ANYKEY** button.

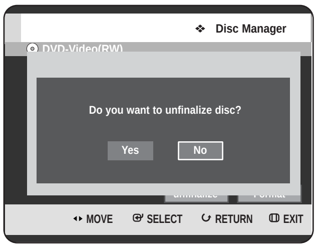

Search
Bookmark
Rec. Mode ▶
Select Madia ▶
Disc Manager

2 Press the ▲▼ buttons to select **Disc Manager**, then press the **ENTER** or ▶ button.


Disc Manager
DVD-Video(RW)
unfinalize
Format
MOVE
SELECT
RETURN
EXIT

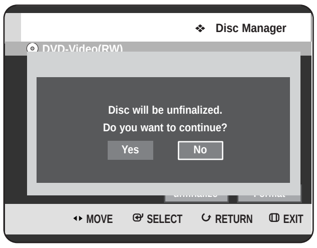
Disc Name
Used Space 00 : 00 : 00
Available Space 00 : 00 SP
Current Rec. Mode DVD-V

3 Press the ◀ ▶ buttons to select **Unfinalize**, then press the **ENTER** button.
You will be prompted with the message “Do you want to unfinalize disc?”.


Disc Manager
DVD-Video(RW)
Yes
No
MOVE
SELECT
RETURN
EXIT

Do you want to unfinalize disc?

If you select **Yes**, you will be prompted again with the message “Disc will be unfinalized. Do you want to continue?”.


Disc Manager
DVD-Video(RW)
Yes
No
MOVE
SELECT
RETURN
EXIT

Disc will be unfinalized.
Do you want to continue?

4 Press the ◀ ▶ buttons to select **Yes**, then press the **ENTER** button.
The disc is unfinalized.

NOTE

- A DVD-RW can be finalized or unfinalized in Video mode.

	Finalize	Unfinalize
Mark	DVD-Video(RW)	DVD-RW(V)
Operation	Same as DVD-Video	Additional recording, protection and deletion are possible.

- A DVD-RW can be finalized or unfinalized in VR mode.

	Finalize	Unfinalize
Mark	DVD-RW(VR:F)	DVD-RW(VR)
Operation	Additional recording, deletion, editing, and protection are impossible.	Additional recording, deletion, editing, and protection are possible.

13. Circuit Operating Descriptions

13-1 Power

13-1-1 About S.M.P.S (ringing choke converter method)

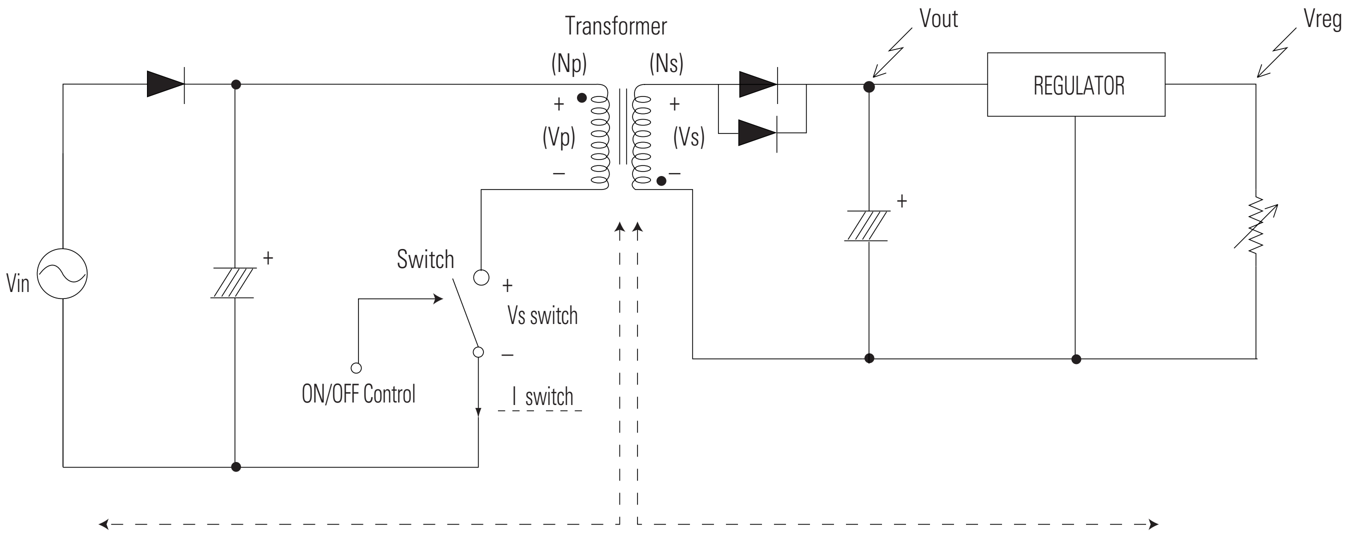

Transformer
(Np)
(Ns)
+
(Vp)
–
+
(Vs)
–
Vout
Vreg
REGULATOR
Vin
+
Switch
+
Vs switch
–
ON/OFF Control
I switch
+

Fig. 13-1

◆Terms

1) 1st : Common power input to 1st winding.
2) 2nd : Circuit followings output winding of transformer.
3) f (Frequency) : Switching frequency (T : Switching cycle)
4) Duty : (Ton/T) x 100

13-1-2 Circuit description [FLY-Back RCC(Ringing Choke Converter)] Control

(a) AC Power Rectification/Smoothing Terminal
   1) PADT1 : Convert AC power to DC (Wave rectification).
   2) PRCU1 : Smooth the voltage converted to DC.
   3) PALT1, PALT2, PACT1, PACT2 : Noise removal at power input/output.
   4) PLRU1 : Rush current limit resistance at the momemt of power cord insertion.
      · Without PLRU1, the bridge diode might be damaged as the rush current increases.
(b) SNUBBER Circuit : PSRZ1, PSRZ2, PSCX1, PSCZ2, PSDZ1

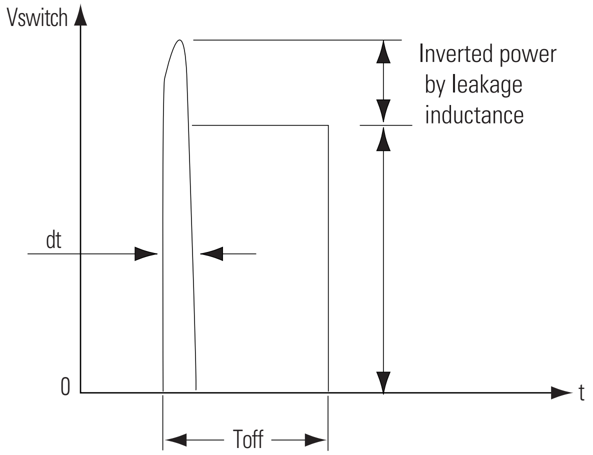


Fig. 13-2

1) Prevent residual high voltage at the terminals of switch during switch off/Suppress noise.
High inverted power occurs at switch off, because of the 1st winding of transformer :
(V=-L1 xdi/dt. L1 : Leakage Induction)
A very high residual voltage exist on both terminals of PQQX1 because dt is a very short.

2) SNUBBER circuit protects PQQX1 from damage through leakage voltage suppression by RC,
(Charges the leakage voltage to PSDZ1 and PSCX1 and discharges to PSRZ1, PSRZ2).

3) PPCF2 : For noise removal

(c) PQIZ1 Vcc circuit

1) PVRL1, PVRL2, PVRL3 : PQIZ1 driving resistance (PQIZ1 works through driving resistance at power cord in)

2) PQIZ1 Vcc : PVRL4, PVDL1, PVCL1

① Use the output of transformer as Vcc,because the current starts to flow into transformer while PQIZ1 is active

② Rectify to PVDL1 and smooth to PVCL1.

③ Use the output of transformer as PQIZ1 Vcc : The loads are different before and after PQIZ1 driving.
(Vcc of PQIZ1 decreases below OFF voltage , using only the resistance dut to lode increase after PQIZ1 driving.)

(d) Feedback Control Circuit

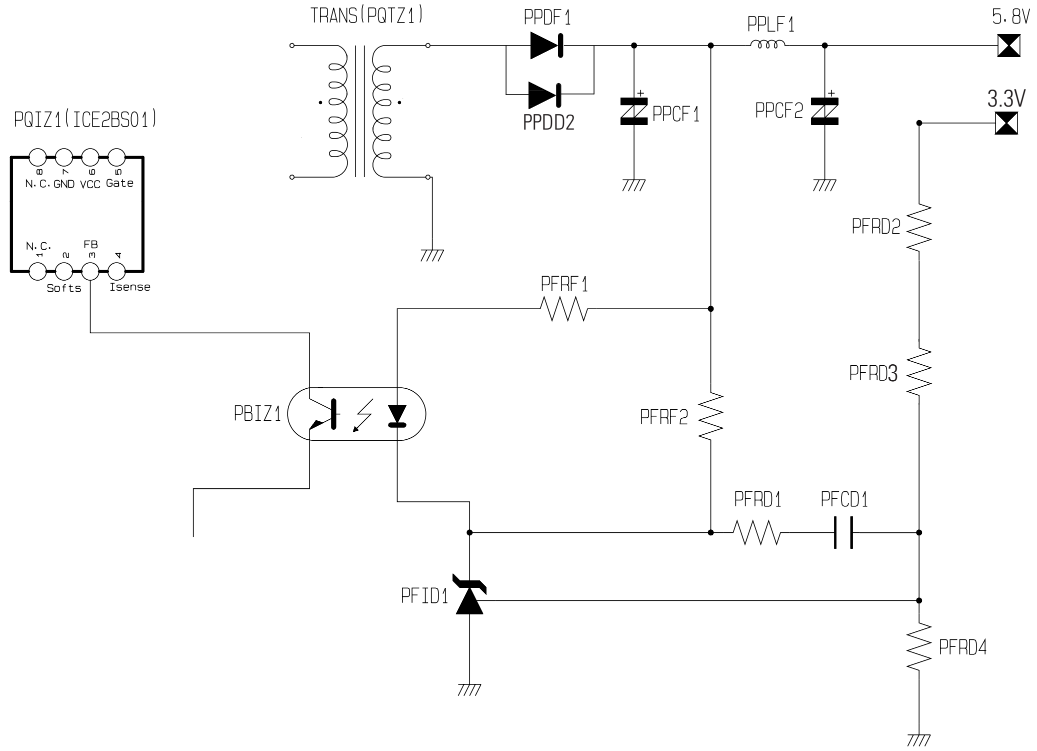

TRANS(PQTZ1)
PPDF1
PPDD2
PPCF1
PPLF1
PPCF2
5.8V
3.3V
PQIZ1(ICE2BS01)
8 7 6 5
N.C. GND VCC Gate
N.C. FB
1 2 3 4
Softs Isense
PFRD2
PFRF1
PFRD3
PBIZ1
PFRF2
PFRD1
PFCD1
PFID1
PFRD4

Fig. 13-3

1) F/B terminal of PQIZ1 determines output duty cyle.
2) C-E (Collector-Emitter) of PQIZ1 and F/B potential of PQIZ1 are same.

13-1-3 Internal Block Diagram (Internal Block Diagram of S.M.P.S. Circuit)

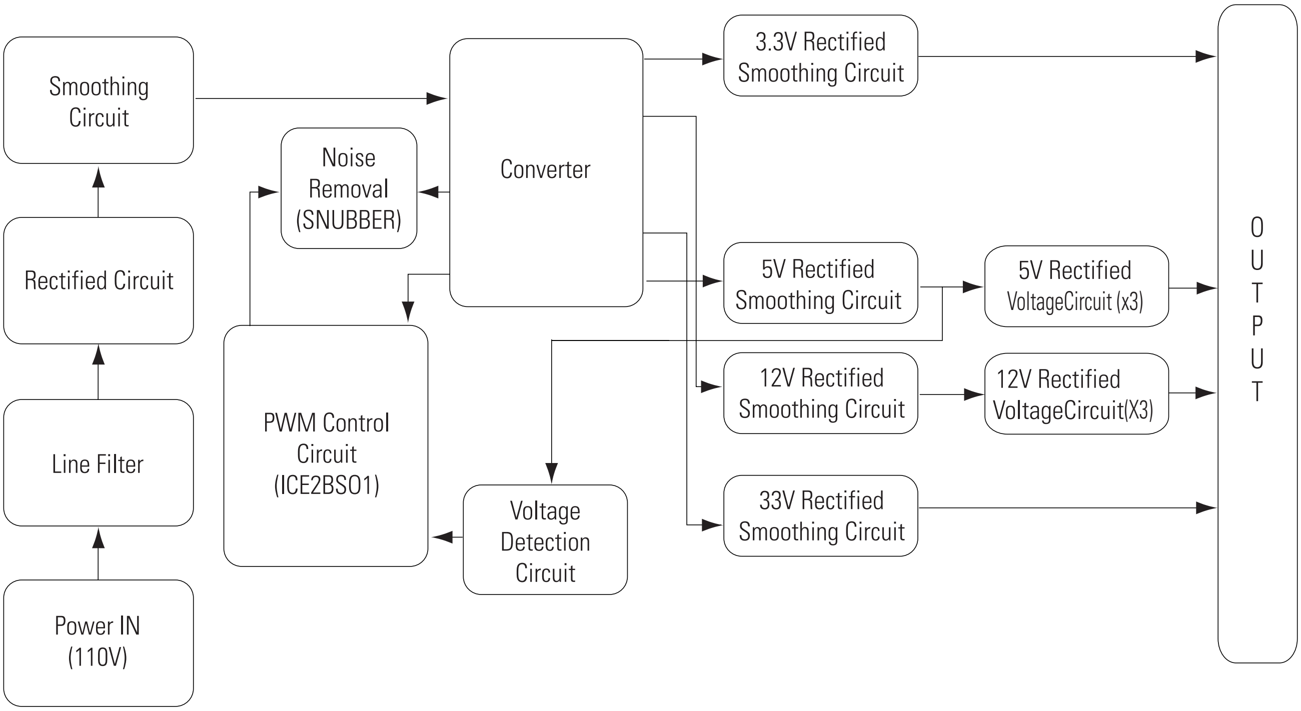

Smoothing Circuit
Rectified Circuit
Line Filter
Power IN (110V)
Noise Removal (SNUBBER)
Converter
PWM Control Circuit (ICE2BSO1)
Voltage Detection Circuit
3.3V Rectified Smoothing Circuit
5V Rectified Smoothing Circuit
5V Rectified VoltageCircuit (x3)
12V Rectified Smoothing Circuit
12V Rectified VoltageCircuit(X3)
33V Rectified Smoothing Circuit
OUTPUT

Fig. 13-4

13-2 AV Codec

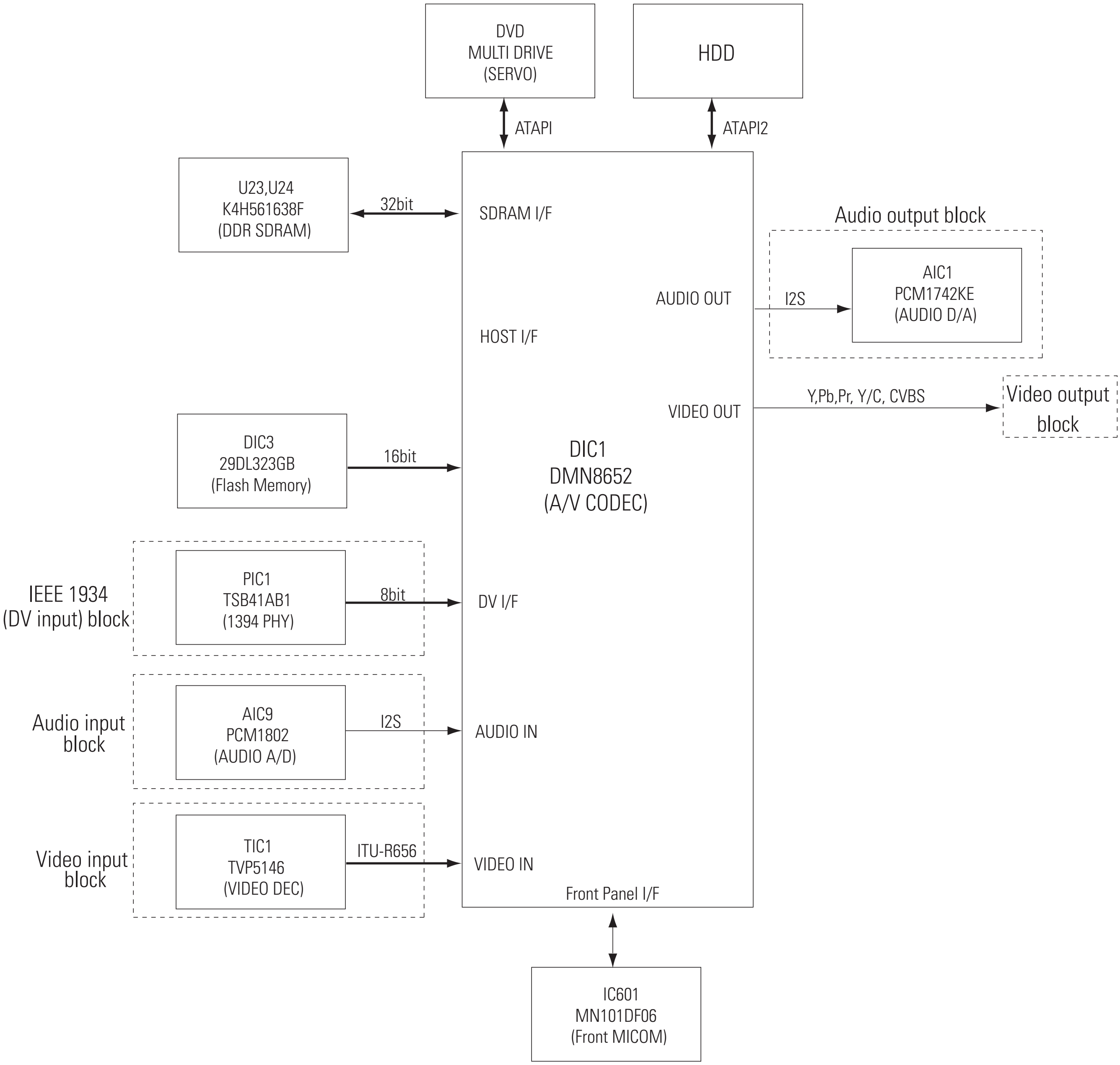

DVD
MULTI DRIVE
(SERVO)
HDD
ATAPI
ATAPI2
U23,U24
K4H561638F
(DDR SDRAM)
32bit
SDRAM I/F
Audio output block
AUDIO OUT
I2S
AIC1
PCM1742KE
(AUDIO D/A)
HOST I/F
VIDEO OUT
Y,Pb,Pr, Y/C, CVBS
Video output block
DIC3
29DL323GB
(Flash Memory)
16bit
DIC1
DMN8652
(A/V CODEC)
IEEE 1934
(DV input) block
PIC1
TSB41AB1
(1394 PHY)
8bit
DV I/F
Audio input block
AIC9
PCM1802
(AUDIO A/D)
I2S
AUDIO IN
Video input block
TIC1
TVP5146
(VIDEO DEC)
ITU-R656
VIDEO IN
Front Panel I/F
IC601
MN101DF06
(Front MICOM)

Fig. 13-5

- · Main system control
- · A/V Encoding/Decoding
- · Transcoding/rating
- · IEEE 1394 link layer function
- · ATAPI interface with DVD-Multi Drive
- · Analog Progressive/interlaced video output

13-2-1 DIC1 Processor Internal Architecture Diagram

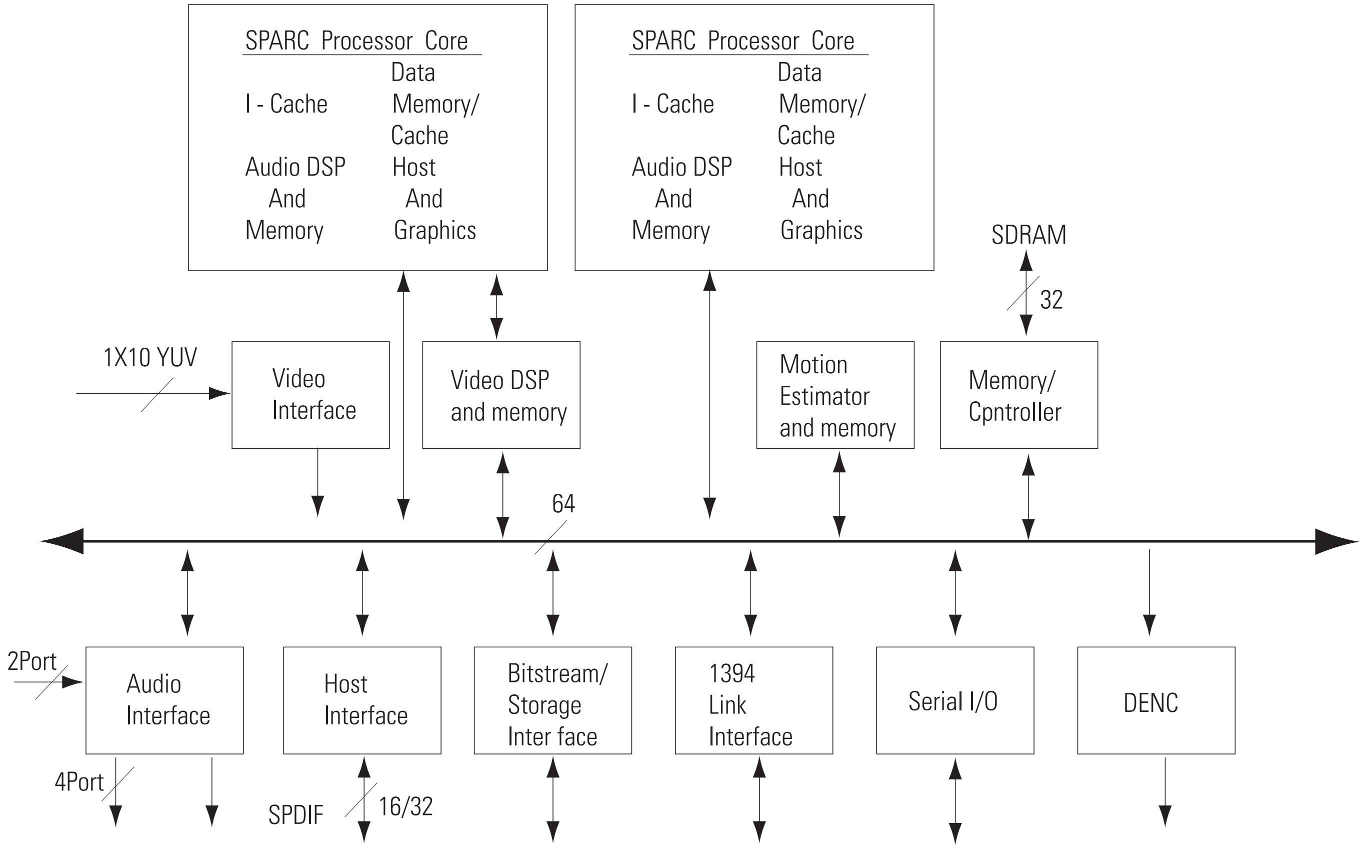

SPARC Processor Core
I - Cache
Data Memory/ Cache
Audio DSP And Memory
Host And Graphics
SPARC Processor Core
I - Cache
Data Memory/ Cache
Audio DSP And Memory
Host And Graphics
SDRAM
32
1X10 YUV
Video Interface
Video DSP and memory
Motion Estimator and memory
Memory/ Cpntroller
64
2Port
Audio Interface
Host Interface
Bitstream/ Storage Inter face
1394 Link Interface
Serial I/O
DENC
4Port
SPDIF
16/32

Fig. 13-6

13-2-2 A/V Processor (DIC1) Functional description

1) SPARC Processors
   Two 32-bit SPARC processors, one dedicated to video processing and the other assigned general system tasks and audio processing, perform three classes of functions: system processing, audio processing, and high-level control flow and decision-making tasks for video processing. Optionally, they can also perform 2D graphics and host functions.
   The DMN8602 also support multiple video inputs, windowed video ad graphics with arbitrarily relocatable and resizable windows, letterbox, and side-by-side display of SD sources.
2) Host Interface
   The host communication functions include initializing the DMN-8652 device, downloading software to the local SDRAM, sending commands, monitoring status, and downloading graphics data such as OSD bitmap.

3. Bitstream/Storage interface

◆ ATAPI Controller

- Primary ATAPI Interface

Primary ATAPI is a standard interface with a 16-bit data bus, which is used to connect devices suchashard disks, CD/DVD ROMs, and DVD RAMs. All operations are initiated by reading/writing a set of ATAPI device registers through programmed input/output(PIO) data transfer. ATAPI has DMA commands for transferring long data. The ATAPI register address is defined by the output pins CS0, CS1, DA[2:0].

- Secondary ATAPI Interface

Secondary ATAPI Interface dose not implment SDRAM-TO-SDRAM operation and has no CSS descramble logic. operation is otherwise indentical to the primary ATAPI interface.

- The IEEE1394 interface can receive MPEG-2 transport stream or DV stream data contained in isochronous packets (IPs). The DMN-8652 device filters the packets by matching channel IDs. In the case of MPEG-2 transport streams, the DMN-8652 device performs descrambling on the data that is scrambled with 5C encryption. Software is responsible for transport section processing and demultiplexing.

4) Video Interface

◆ Video Input channel

The video input channel captures ITU-R BT.656-compliant 10-bit digital YUV component video stream from Video decoder chip(TIC1)

◆ Video Digital Encoder (DENC)

The NTSC/digital video encoder (DENC) module converts a digital video data stream into NTSC composite or component video output.

The DMN-8652 DENC output can be in one of the following formats:

- Baseband composite NTSC (M) analog video.
- Separate analog luma(Y) and chroma(C) output to support S-Video.
- Separate analog component video SMPTE YPbPr output.

5) Audio Interface

The serial audio input port receives uncompressed 16- to 24-bit serial digital audio data from external audio ADC(AIC9). An internally generated clock provides bit serial clocking of the data coming from external ADC
The serial audio output port sends uncompressed 16- to 24-bit serial digital audio data to external audio DAC(AIC1). An internally generated clock provides bit serial clocking of the data coming from external ADC

6) Serial I/O interface

◆ SPI interface

The SPI(Serial Peripheral Interface) port provides a bus for a serial interface with front panel micom(FIC1)

◆ IDC interface

The IDC bus is a simple, two-wire, bidirectional communication bus. The two signals, clock and data, are common to every device connected to the bus.

In this system, IDC bus is connected to EEPROM(DIC8) and Video Decoder(TIC1)

13-3 SERVO (DVP Multi Drive)

1) Pick-Up

Data in the disc is processed from the optical pick-up unit (OPU). OPU includes the Elantec chip (EL6912c) which is a highly integrated laser diode driver designed to support multi-standard writable optical drives. This chip also has an IV amplifier with concurrent read and write sampling. The architecture allows reprogramming of the timers to support different media DVD or CD standards, and different speed.

2) A-Chip

A chip is RF processor. This module performs RF signal processing which includes RFIP, RFIN, AGC, RF equal izer. This processor is able to detect tracking error, focus error and various signals such as CE, PE, SBAD, DEFECT, BCA, MIRROR, Wobble, TZC, RC, and RECD.

3) C-Chip

C-Chip is composed of DP1, PRML and WS.

First, the Data processor1 (DP1) performs EFM/EFM+ Demodulation and data is stored in the buffer memory in data processor2 (DP2). DVD data in this buffer is transferred to CSS/ATAPI through error-correction code

(ECC), descramble process and error detection code (EDC).

Second, WS performs the following processes.

① Delay compensation using Shift register
② Sample/Hold pulse generation
③ I/V Gain Control
④ Providing clock for RF chip
⑤ OPC Control signal generation

Lastly, PRML completes the adaptive EQ/VD and Digital PLL.

4) D-Chip

D-Chip consists of Servo DSP, DP2 and 1Mbit memory. Servo DSP is dealing with controlling the servo-mecha nism in DVD recorder. Servo-DSP has the following features.

① Bulit-in 10Bit ADC(8ch), DAC(3ch) and PWM(7ch)
② Step Motor Control Logic: Macro/Micro Step
③ Track Counter: long distance velocity control direct seek
④ Shock/Defect detection
⑤ Header (DVD-RAM)/Land Pre-Pit (DVD-R/RW) Detection
⑥ Several Servo Monitor Signal Detection
⑦ RF IC Interface
⑧ Micom Interface
⑨ Digital Servo Control of focus, tracking, sled and seek
⑩ Disc Auto-Detection
⑪ Automatic Adjustment of the offset, balance and gain of Focus and Tracking Signal
⑫ Direct Seek with Velocity Control
⑬ Step Motor Control: Macro Seek
⑭ De-Track and Lens Shift Detection and Compensation
⑮ Center Error Control
⑯ DVD Layer Jump
⑰ Tilt Detect and Compensation

DP2 performs High Speed ECC and CD DA Decoder.

5) ATAPI Controller

ATAPI (ATA Packet Interface) the standard interface protocol used to connect the CD/DVD Drive to IDE inter face. Data from the front-end is processed to back-end through this ATAPI protocol. Sanyo chip (LC98600CT-XB0) is utilized for ATAPI interface. LC98600CT-XB0 has the following features.

① ECC and EDC correction/addition for CD-ROM data
② Subcode decoding/encoding
③ Spindle servo control
④ CLV/CAV servo control using ATIP data
⑤ ATIP decoding and CRC check functions
⑥ Providing random EFM output for PCA use
⑦ High-accuracy write strategy signal output enabled (CD-R 52x)
⑧ Buffer RAM can be accessed by the microcontroller through the LC98600CT-XB0
⑨ Built-in ATA-PI(IDE) interface (supports Ultra DMA modes 0,1, and 2)
⑩ 52x decoding speed/52x encoding speed supported with 33.8688Mhz
⑪ Maximum transfer speed PIO mode: 16.6 MB/s (with IORDY), Ultra-DMA: 66MB/s (with DMARQ)
⑫ User can freely set the CD main channel, C2 flag, and subcode areas in buffer RAM
⑬ Built-in batch transfer function for transferring (CD main channel, C2 flag, etc., in a single operation)
⑭ Built-in multi-transfer function (allows multiple blocks to be sent to the host automatically in a single operation)

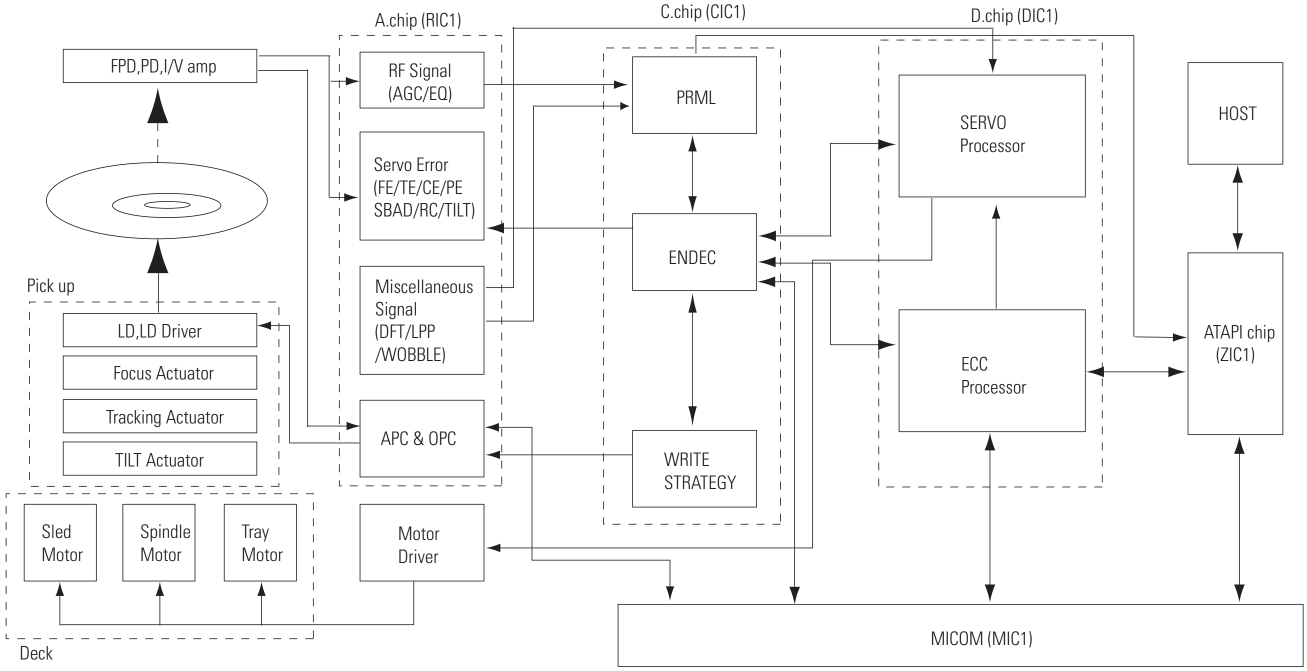

A.chip (RIC1)
C.chip (CIC1)
D.chip (DIC1)
FPD,PD,I/V amp
RF Signal (AGC/EQ)
Servo Error (FE/TE/CE/PE SBAD/RC/TILT)
Miscellaneous Signal (DFT/LPP /WOBBLE)
APC & OPC
PRML
ENDEC
WRITE STRATEGY
SERVO Processor
ECC Processor
HOST
ATAPI chip (ZIC1)
Pick up
LD,LD Driver
Focus Actuator
Tracking Actuator
TILT Actuator
Sled Motor
Spindle Motor
Tray Motor
Deck
Motor Driver
MICOM (MIC1)

Fig. 13-7

13-4 Video Input

13-4-1 Video Input Outline

DVD-HR720 is the two Line Video input. AV 1 Video input is CVBS1 & S-Video1 at the Rear Panel. AV 2 Video input is CVBS2 at the Front Panel.
The analog Video signal select AV 1 or AVe 2 by the FIC1 (Front Micom).
TIC1 (Video Decoder) diverges from the 14.318185MHz crystal, then generates ITU-R656 (10bits) and 27MHz clock.
TIC1 (Video Decoder) does closed caption, copy guard detect processing and A/D conversion of analog Video signal converted into 11bit Digital Video signal (ITU-R656 Format) is outputted via DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.

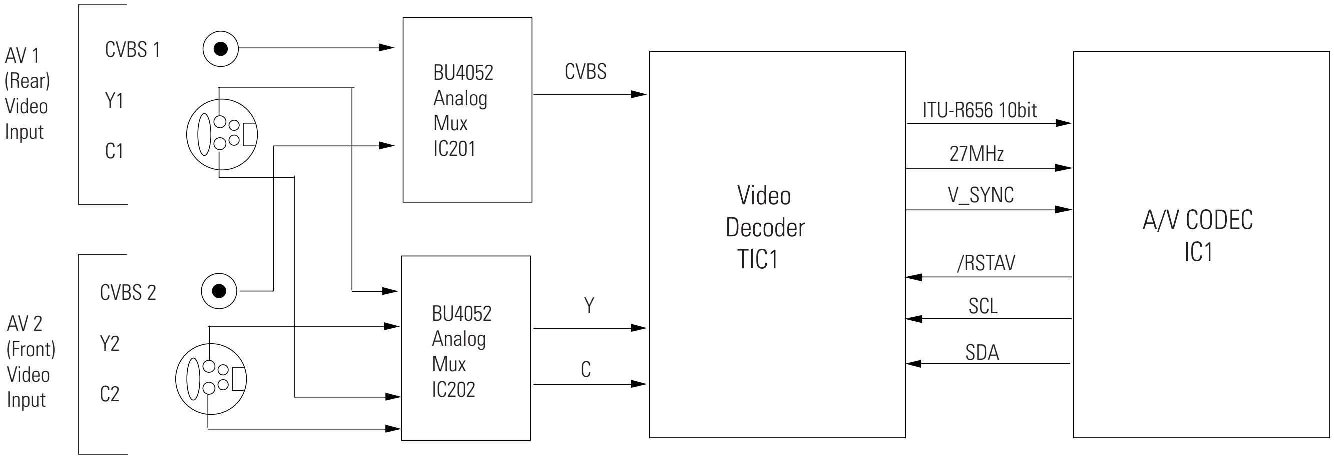

AV 1
(Rear)
Video
Input
CVBS 1
Y1
C1
AV 2
(Front)
Video
Input
CVBS 2
Y2
C2
BU4052
Analog
Mux
IC201
BU4052
Analog
Mux
IC202
CVBS
Y
C
Video
Decoder
TIC1
ITU-R656 10bit
27MHz
V_SYNC
/RSTAV
SCL
SDA
A/V CODEC
IC1

Fig. 13-8

13-4-2 Analog Mux (BU4052)

IC201 and IC202 is Analog Mux.
As Pin 9, 10 of the IC201 & IC202 are controlled by the Front Micom, IC201 select Line1 of CVBS[Pin14] and Line2 of CVBS[Pin 15] and IC202 select Line1 of S-Video[Pin5, Pin14] and Line2 of S-Video[Pin2. Pin15].
The analog Video Signal of IC201 & IC202 output is selected by the FIC1 via TIC1(Video Decoder : TVP5146) of analog Video input parts.

13-4-3 NTSC/PAL Video Decoder (TVP5146 : Video Decoder)

The TIC1 (Video Decoder : TVP5146) device is a high quality, single-chip digital video decoder that digitizes and decodes all popular baseband analog video formats into digital component video. The TIC1 (Video Decoder : TVP5146) supports the analog-to-digital (A/D) conversion of component RGB and YPbPr signals, as well as the A/D conversion and decoding of NTSC composite and S-video into component YCbCr.
This TIC1 (Video Decoder : TVP5146) includes four 10-bit 30-MSPS A/D converters. and A/D conversion of 10bit analog Video signal converted into Digital Video signal (ITU-R656 Format) is outputted via
DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.
The following output formats supply 10-bit 4:2:2 YCbCr to the DIC1 (MPEG2 Decoder & Encoder with video Encoder) of digital part.
On CVBS and S-video inputs, the user can control video characteristics such as contrast, Brightness, saturation, and hue via an I2C DIC1 port [PIN V17, V18] interface.
The TVP5146 decoder includes methods for advanced vertical blanking interval (VBI) data retrieval. The VBI data processor (VDP) slices, parses, and performs error checking on teletext, closed caption (CC), Copy Guard Detect Processing and other VBI data.

13-5 Video Output

13-5-1 Outline

DIC1 (MPEG2 Decoder & Encoder with video Encoder) diverges from the 13.5MHz crystal, then generates VSYNC and HSYNC.
DIC1 (MPEG2 Decoder & Encoder with video Encoder) does RGB encoding, copy guard processing and D/A conversion of 10bit Video signal converted into analog signal is outputted via amplifer of analog part.

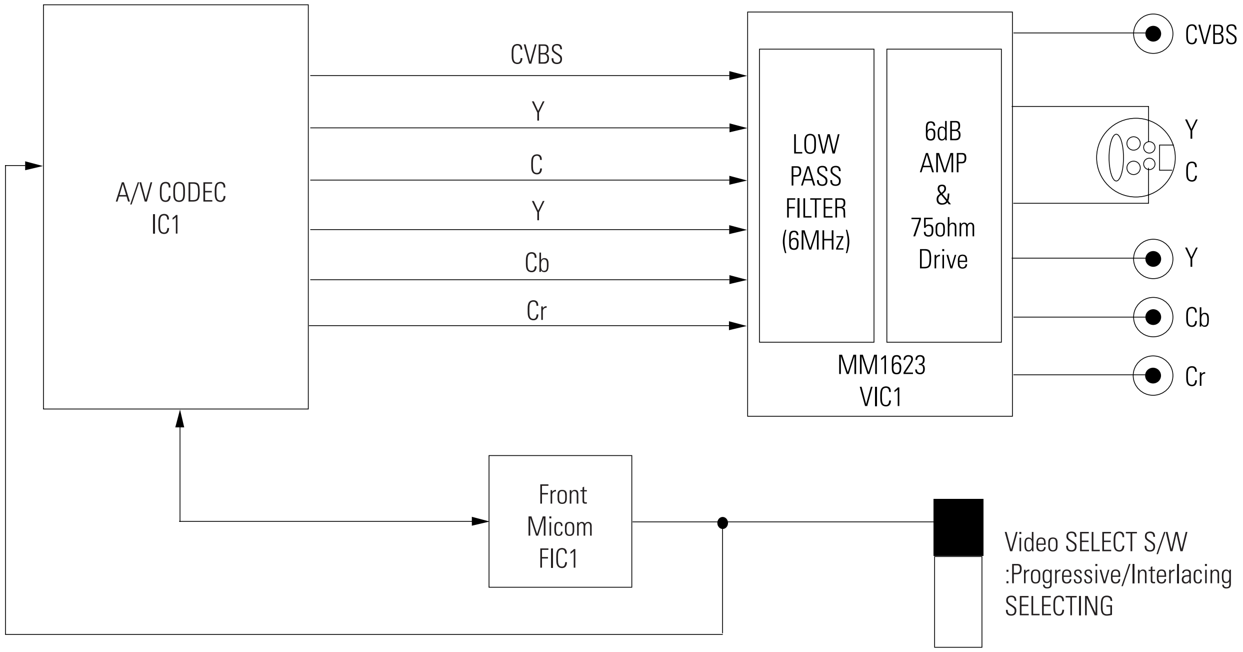

A/V CODEC
IC1
CVBS
Y
C
Y
Cb
Cr
LOW
PASS
FILTER
(6MHz)
6dB
AMP
&
75ohm
Drive
MM1623
VIC1
CVBS
Y
C
Y
Cb
Cr
Front
Micom
FIC1
Video SELECT S/W
:Progressive/Interlacing
SELECTING

Fig. 13-9

13-5-2 NTSC/PAL Digital

DIC1 inputted from pin E1 with 13.5MHz generates HSYNC and VSYNC which are based on video signal. DIC1 is synchronous signals with decoded video signal.
The above signals, which are CVBS (Composite Video Burst Synchronized), Y(S_Video), C(S_Video), Y(Component)/Cr(component)/Cb(component) are selectively outputted 480i (interlaced Video Output), 480P(progressive Video Output) by the rear switch. DiC1 adopts 10bit D/A converter.
DIC1 perform video en-coding as well as copy protection.

13-5-3 Amplifier (MM1623)

VIC1 is 6dB amplifier.
Based on CVBS signal, the final output level must be 2Vpp without 75ohm terminal resistance.
Because the level of video encoder output is only 1Vpp, the level is adjusted with the special amplifier.
When mute of pin 3 is high active, if the pin is floating and connect to power, the output signal is never out putted.
CVBS, Y, C, Y(R), Cb(B), Cr(R) outputted from video encoder are inputted to VIC1 [Pin4, 6, 2, 10, 12, 14] respec tively.
The signal to which gain is adjusted by amplifier is outputted from jack via 75ohm Resistance
(VR14, 15, 16, 23, 12, 13).

13-6 Audio

13-6-1 Input Block

DV-HR720 has two stereo line input terminals. and internal TV-audio from RF Tuner Block. These three Analog audio signal source are converted to digital data by Input Block.
Input Block has a Multiplexer (IC203), Input Filter (AIC81, AIC82), and A/D converter (AIC9).
IC203 change it's output by selection control signal from FIC1 (Front Micom).
The output signal of IC203 are filtered by OP-Amp (AIC81, AIC82).
AIC81 (L-ch) have two op-amp in each.

13-6-2 Output Block

DV-HR720 has two stereo analog line out terminal, and two digital output terminal.
Decoded signal by DIC1 is inputted to AIC1 (D/A Converter), then filtered and amplified by AIC4 (OP-Amp).
And the digital audio signal (IEC-958) is drived by AIC3 inverter and ouputted in Optical/Coaxial (S/PDIF) terminal.

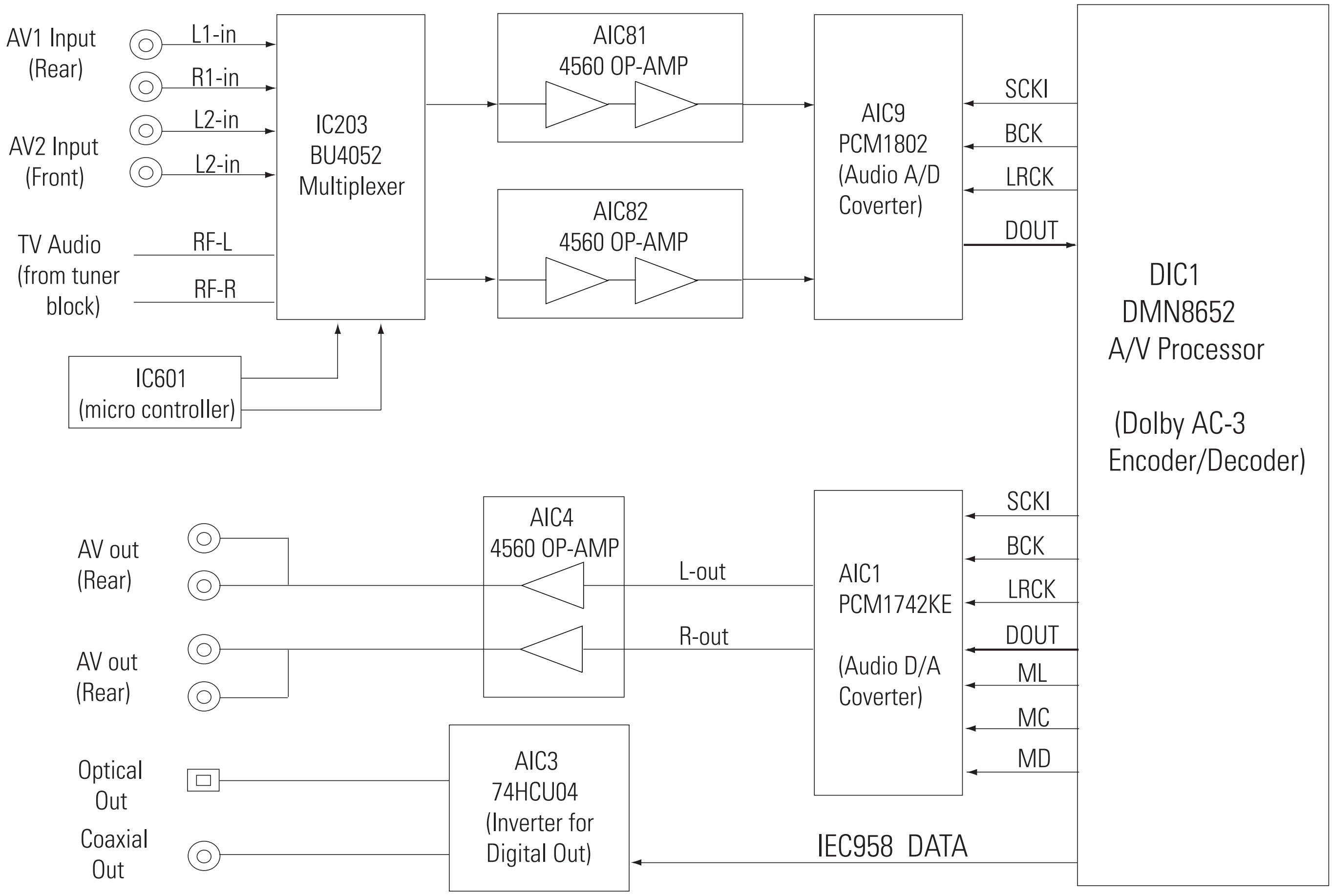

AV1 Input
(Rear)
AV2 Input
(Front)
TV Audio
(from tuner
block)
L1-in
R1-in
L2-in
L2-in
RF-L
RF-R
IC203
BU4052
Multiplexer
IC601
(micro controller)
AIC81
4560 OP-AMP
AIC82
4560 OP-AMP
AIC9
PCM1802
(Audio A/D
Coverter)
SCKI
BCK
LRCK
DOUT
DIC1
DMN8652
A/V Processor
(Dolby AC-3
Encoder/Decoder)
AV out
(Rear)
AV out
(Rear)
AIC4
4560 OP-AMP
L-out
R-out
AIC1
PCM1742KE
(Audio D/A
Coverter)
SCKI
BCK
LRCK
DOUT
ML
MC
MD
Optical
Out
Coaxial
Out
AIC3
74HCU04
(Inverter for
Digital Out)
IEC958 DATA

Fig. 13-10

13-7 Tuner

1) Low Pass Filter & High Pass Filter
This consists of IF trap circuit and UHF & VHF separation circuit. If the input signal is IF (45.75MHz), this filter
prevents interference.

2) Single tune
This consists of a filter circuit, RF AMF, impedance conversion circuit, image trap and a single tuning circuit. It prevents noise and other interference signals. It is very important part which improves NF (noise figure) and prevents the various of spurious signals.

3) RF AMF
RF AMF is made of FET (Field Effects Transistor). It is controlled by AGC coming from IF DEMOD block.

4) Double tune
It consists of a double tuning circuit to improve characteristic of rejection that results in a better band characteristic.

5) Mixer IC (Mixer, OSC, PLL)
It consists a VHF and UHF OSC and Mixer circuit. We applied mixer to make better characteristic of rejection, it shows especially various beat characteristic.

6) PLL IC
The PLL IC plays a role selection of Tuner channel. It was built-in three wire PLL IC, charge pump and band driver.
The minimum of step frequency is 31.25KH z.

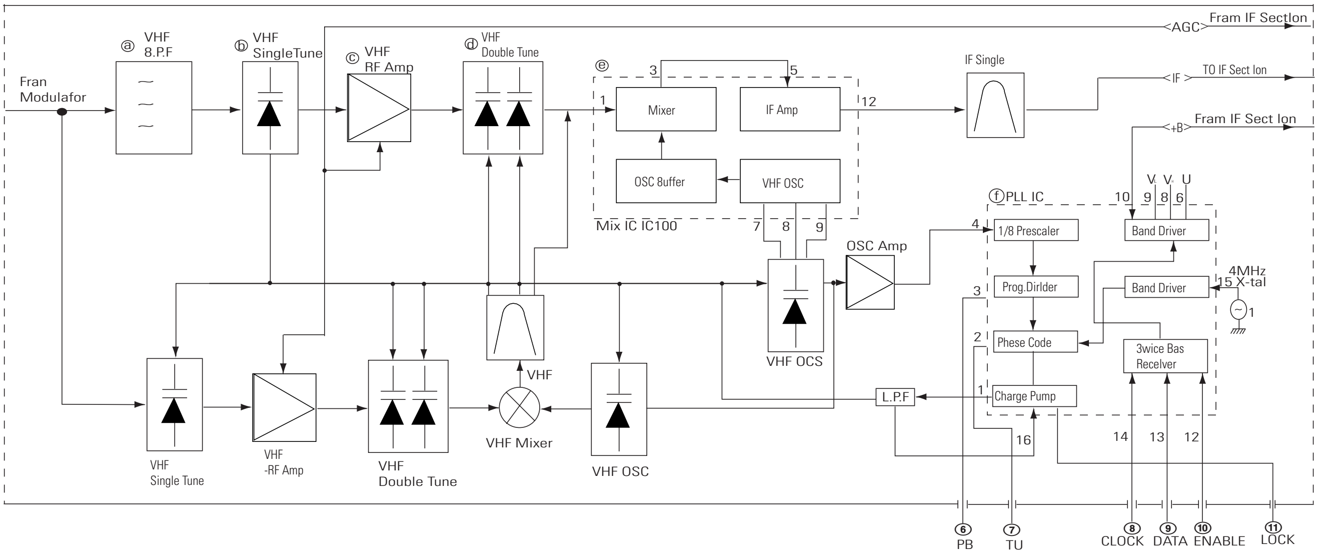

Fran Modulafor
ⓐ VHF 8.P.F
ⓑ VHF SingleTune
ⓒ VHF RF Amp
ⓓ VHF Double Tune
ⓔ
3
5
1
Mixer
IF Amp
12
OSC 8uffer
VHF OSC
Mix IC IC100
7
8
9
IF Single
<AGC> Fram IF Sectlon
<IF > TO IF Sect Ion
<+B> Fram IF Sect Ion
OSC Amp
VHF OCS
ⓕ PLL IC
4
1/8 Prescaler
3
Prog.Dirlder
2
Phese Code
1
Charge Pump
16
10 9 8 6
V V U
Band Driver
Band Driver
4MHz
15 X-tal
1
3wice Bas Recelver
14 13 12
L.P.F
VHF
VHF Single Tune
VHF -RF Amp
VHF Double Tune
VHF Mixer
VHF OSC
⑥ PB
⑦ TU
⑧ CLOCK
⑨ DATA
⑩ ENABLE
⑪ LOCK

Fig.13-11

13-8 IF

1) SAW FILTER
   It passes only needed band of the signal that is converted to IF frequency and decrease the others band to minimize the effect of adjacent channel.

2) RF AGC Control
   Used to determine RF AGC working point in tuner.

3) VCO Tank
   When VCO tank detects PLL, it makes the signal which sets a standard.

4) AFT (Auto Frequency Tuning)
   AFT automatically controls the oscillator frequency in the tuner, so that it retains a constant level.
   It is a quadrature detection type. The carrier, which is detected from video det is directly input to AFT.
   The 90 degree delayed phase signal is input at the same time to AFT and, the results come out.

5) IF AMP
   IF signal , which is selected in Saw filter, is amplified in IF amp frequency enough to be detected. The IF amp has parallel inputs & outputs structure.

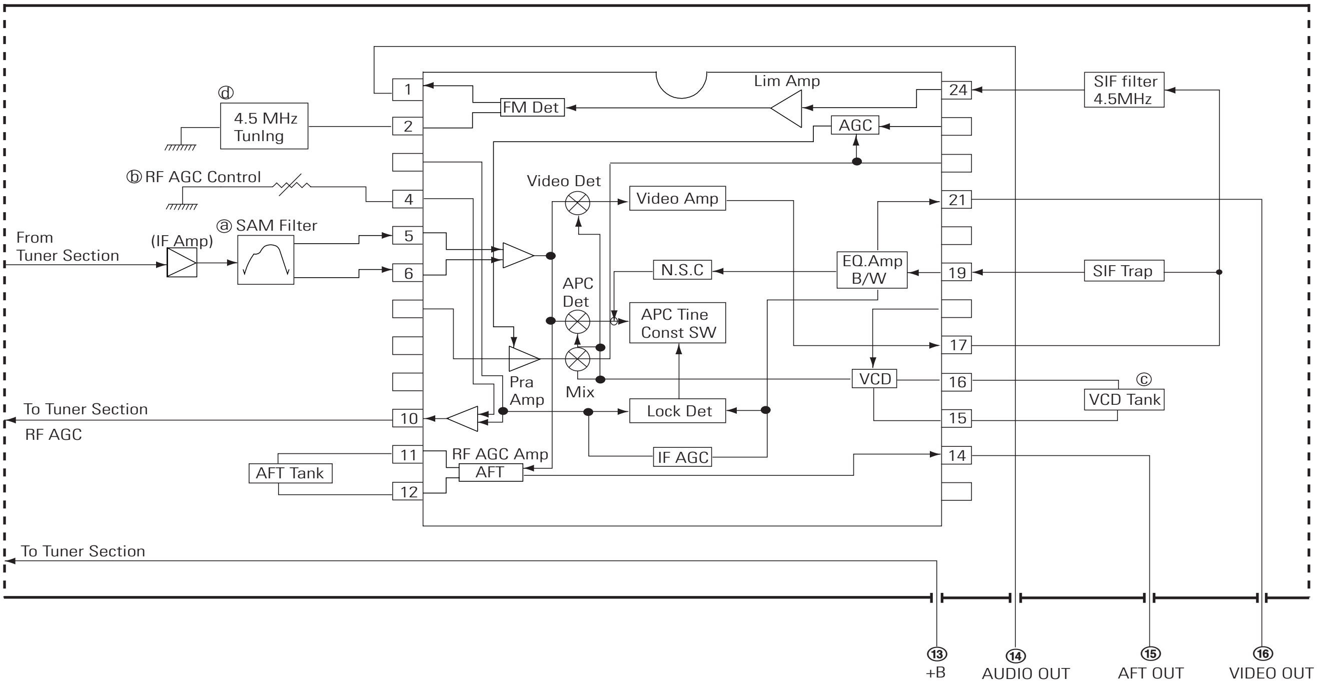

ⓓ
4.5 MHz
TunIng
ⓑ RF AGC Control
ⓐ SAM Filter
From
Tuner Section
(IF Amp)
To Tuner Section
RF AGC
AFT Tank
1
2
4
5
6
10
11
12
FM Det
Lim Amp
AGC
Video Det
Video Amp
N.S.C
APC
Det
APC Tine
Const SW
Pra
Amp
Mix
Lock Det
IF AGC
RF AGC Amp
AFT
EQ.Amp
B/W
VCD
24
21
19
17
16
15
14
SIF filter
4.5MHz
SIF Trap
ⓒ
VCD Tank
To Tuner Section
⑬
+B
⑭
AUDIO OUT
⑮
AFT OUT
⑯
VIDEO OUT

Fig. 13-12

MEMO

14. Reference Information

14-1 Introduction to DVD

14-1-1 The Definition of DVD

DVD is the next generation medium and is the acronym of the Digital Versatile Disc or thr Digital Video Disc, which maximizes the saving density of the disk surface using the MPEG-2 compression technology to enable the storage of 17G bytes of data on the same size CD.

1) 7 times the storage capacity of the conventional CD

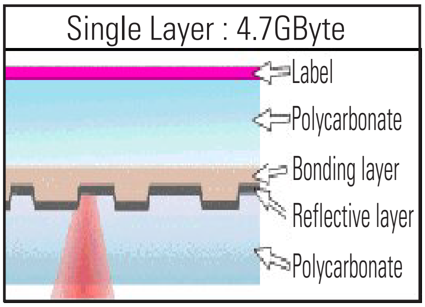
- Minimized the track pitch and pit size to 1/2 of conventional CD.
- Uses red laser with short-wavelenght of 650nm (635nm).

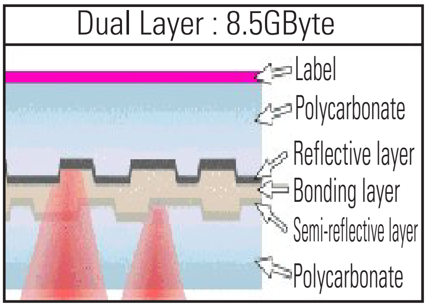
• DVD Vs. CD-ROM

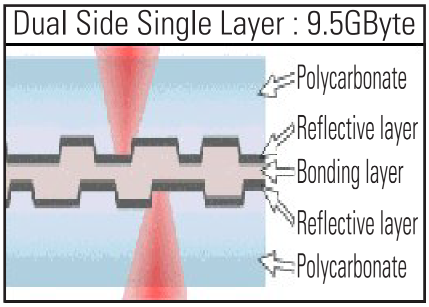
	CD-ROM	CD-R/RW	DVD-ROM	DVD-R/RW	DVD-RAM
Disc Thickness	1.2mm	1.2mm	0.6*2mm	0.6*2mm	0.6*2mm
Lens NA	0.45	0.45(0.5)	0.6	0.6	0.6
Laser wavelenght	780um	780um	650um	650um	650um
Track pitch	1.6pm	1.6pm	0.74pm	0.74pm	0.615pm
Capacity	0.65GB	0.65GB	4.7GB	4.7GB	4.7GB
Track structure	Pit train	Groove	Pit train	Groove	Land/Groove

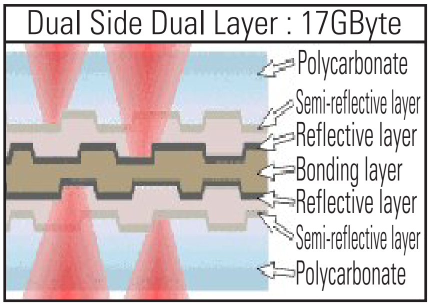
2) Disc Formats

DVD consists of two 0.6mm discs attached together, enabling access to the upper and lower side of the disk, and 4 sides could be used at maximum.


Single Layer : 4.7GByte
Label
Polycarbonate
Bonding layer
Reflective layer
Polycarbonate


Dual Layer : 8.5GByte
Label
Polycarbonate
Reflective layer
Bonding layer
Semi-reflective layer
Polycarbonate


Dual Side Single Layer : 9.5GByte
Polycarbonate
Reflective layer
Bonding layer
Reflective layer
Polycarbonate


Dual Side Dual Layer : 17GByte
Polycarbonate
Semi-reflective layer
Reflective layer
Bonding layer
Reflective layer
Semi-reflective layer
Polycarbonate

14-1-2 DVD Types

FORMAT	TYPE	APPLICATIONS
DVD-Video	Playback Only	High quality image and sound for movies and other video media.
DVD-ROM	Read Only	Multi-functional, multi-media software that requires large storage capacity.
DVD-Audio	Playback Only	High quality sound that exceeds the CD, multi-channel Audio.
DVD-R	1 Time Recording	As with CD-R, write only once
DVD-RAM	Rewritable (more than 100,000times)	This can be virtually used as hard-disk, with a random read-write access
DVD-RW	Rewritable (About 1000times)	Similar to DVD-RAM except than its technology features a separated read-write access more like phonograph than a hard disk.

14-2 DVD-Video Fromat

14-2-1 Main Features

1) Able to store up to 160 minutes of Movie by utilizing the MPEG-2 compression technology. (Aver. 133min.)

2) Enables more than 500 lines of horizontal resolution. (Class corresponding to the Master Tapes used in broadcasting stations)

3) Provides Dolby Digital 5.1ch Surround 3D sound, which enables theater quality sound (NTSC area).

- For PAL areas, 1 of either MPEG-2 Audio or Dolby Digital must be selected.

4) Multi-Language

- Able to store up to 8 languages of dubbing.
- Able to store up to 32 subtitle languages.

5) Multi-Aspect Ratio
3TV Mode alternatives ; 16:9 Wide Screen (DVD Basic)/4:3 Pan & Scan/Letter Box.

6) Multi-Story
Possible to implement Interactive Viewing which enables the user to select the scenario.

7) Multi-Angle
Able to view the camera angle you selected among the scenes recorded with multiple camera angles.

Note ; The above media features must have the DVD Title that contains the appropriate contents to function properly.

14-2-2 Audio & Video Specifications

Classification		DVD-Video		Video-CD	LD
VIDEO	Compression	MPEG-2		MPEG-1	Analog
	Pixel	720 x 480		352 x 240	
	Horizontal resolution	Max. 500 Lines		Max. 250 Lines	Max.420 Lines
	Compression rate	1/40		1/140	Analog
	Transmission speed	Max. 9.8Mbps (variable)		1.15Mbps (fixed)	
	TV aspect	16:9 / 4:3		4:3	4:3
AUDIO	Audio	Max. 8 streams		2CH stereo	2 Analog CH. 2 Digital CH. (16Bit/44.1KHz) or 1 Analog CH. 1 Stream of Dolby Digital 2 Digital CH. (16Bit/44.1KHz)
	Recording type	Dolby Digital	Linear PCM	MPEG-1 Layer 2	
	Transmission rate	448Kbps/stream	6.144Mbps/stream	224Kbps	
	Channel	5.1CH/stream	8CH/stream	2CH	
	Sampling frequency	48KHz	16, 20, 24Bit/48, 96KHz	16Bit/44.1KHz	

14-2-3 Detailed Feature

DVD-Video Feature 1

When Developing the DVD Software, various addition and modification is possible.

As the storage capacity increases, the DVD-Video separates the main data and the additional data such as the Multi-Function into different data areas, enabling the control of time-data ratio to provide the format that enables the flexible Software development

- 1 Movie (3.5Mbps)
  + Subtitle (1 Language)
  + Surround Audio (1 Language)
  = 160min storage (4.673Gbytes)

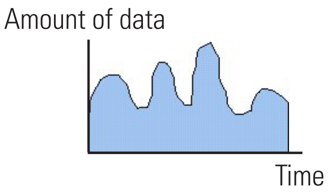
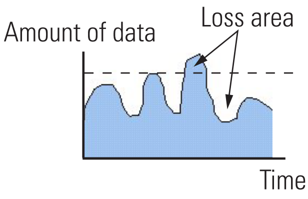
- 1 Movie (3.5Mbps)
  + Subtitle (4 Language)
  + Surround Audio (4 Language)
  = 160min storage (4.680Gbytes)

- 1 Music Video (4Mbps)
  + 2ch High quality Audio (96kHz/24bit)
  = 72min storage (4.648Gbytes)

DVD-Video Feature 2

Application of the MPEG-2 compression technology.

DVD-Video uses the variable compresion technology, the MPEG-2 to compress the moving image optimally, minimizing the Data loss to Provide a clear, natural screen while increasing the storage time.

DVD-Video	• MPEG-2 (Variable compression : Max. 1/40) - Field unit compression. - Compression rate change according to the amount of Data. - Differentiates the still image and the moving image compression rate, reducing Data loss and enables efficient compression.	
Video-CD	• MPEG-1 (Fixed compression : Max. 1/140) - Frame unit compression. - Compresses all data using the same ratio. • Fast movements are jagged, and unnatural	

DVD-Video Feature 3

High quality surround audio.

DVD-Video can store the audio using the 5.1ch Dolby Digital compression or the advanced Liner PCM method, providing the better-than-CD quality and theater like audio quality.

- DTS (Digital Theater System)
  Home theatre and music playback in the home, DTS provides high quality 5.1-channel surround sound with many extras not offered by other consumer formats. As well as handling DTS-branded releases from a growing number of music labels and consumer software producers, DTS provides enhanced 6.1 matrix and DTS 6.1 discrete decoding that envelopes the listener in sound. DTS technology is featured in a wide cross section of receiver/pre-amplifiers, DVD players and and add-on components from leading consumer audio vendors

- Dolby Digital (AC-3)
  - Unlike the traditional Dolby pro-Logic method, the Dolby Digital method separates all 5 main channels (Front L/R, Center, Surround (Rear) L/R)and the Sub woofer to provide live surround audio.
  - Using the Down Mix method, the conventional Dolby Pro-Logic and Stereo are all compatible.
  - Each separated channels are played back at CD quality sound. (Frequency band: 20Hz ~ 20KHz)

- Linear PCM (Pulse Code Modulation)
  - Provides the high quality Digital sound without the audio data compression.
  - Various Digital Recordings are possible as shown in the table to the right.

Sampling Frequency	Bit Rate
48KHz	16bit
	20bit
	24bit
96KHz	16bit
	20bit
	24bit

- Dolby Digital compatible Audio Mode

Audio Coding Mode	Channel Format					Remark
		Front		Surround (Rear)		
	L	C	R	L	R	
1/0		0				Mono
2/0	0		0			Stereo
3/0	0	0	0			Surround
2/1	0		0	Mono		
3/1	0	0	0	Mono		
2/2	0		0	0	0	
3/2	0	0	0	0	0	

DVD-Video Feature 4

Multi-Language

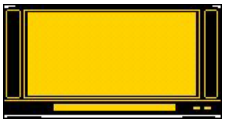
- Audio Dubbing - Max. 8 Languages
- Subtitle - Max. 32 Languages. Capable of storing, and selectiong.
- Linear PCM (Pulse Code Modulation)

DVD-Video Feature 5

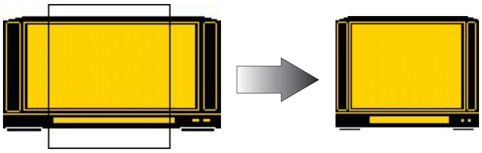
Multi-Aspect

- Unlike the conventional VCD or LD, DVD-Video has the default of 16:9 Wide, and can be viewed using the conventional 4:3 TV, enabling the expansion of viewer selection capabilities.

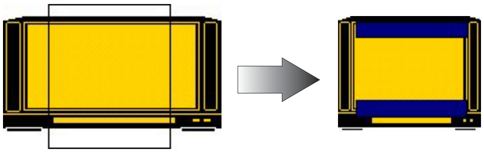
  - 16 : 9 TV : Wide Mode (16:9 Wide Full Screen)
  - 4 : 3 TV : Letter Box Mode, Pan & Scan Mode



16:9 Wide



4:3 Pan & Scan



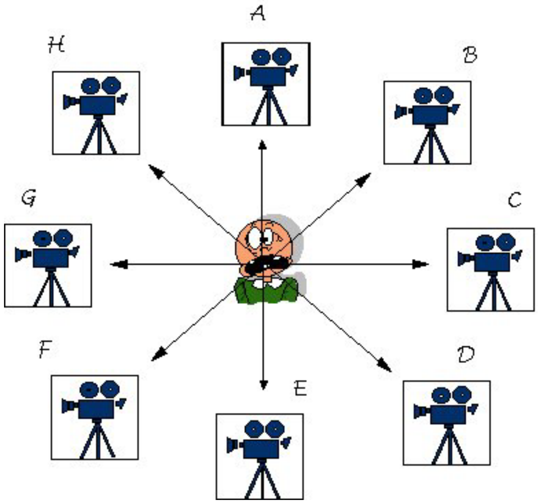
4:3 Letter Box

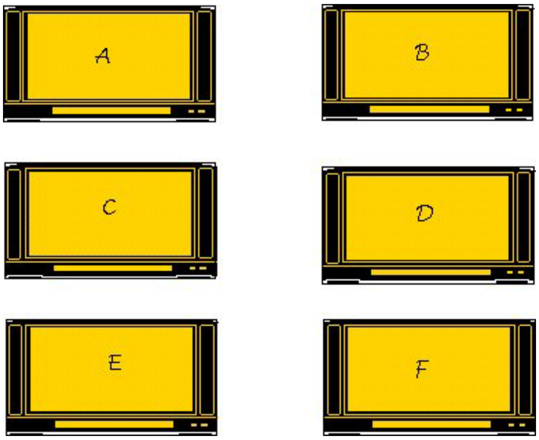
Note ; This function is disc-dependent, may not work on all DVDs.

DVD-Video Feature 6

Multi-Angle

- Up to 9 angles of view may be stored, enabling the viewer to select a specific viewpoint at a given time.
  --> Especially, for the Music Video and Sports Title, this provides a more lively image of the scene.





Note ; This function is disc-dependent, may not work on all DVDs.

DVD-Video Feature 7

Multi-Story

- DVD-Video provides the enviroment suitable for the bi-directional Software develoment, providing multiple scenarios. This feature enables the Multi-Story function.

OPTION

Parental Lock

- For the titles that are not suitable for children viewing, Parental Locks are set, requesting user defined passwords for viewing
- Parential Locks may be set on specific frames of the Title, enabling the player to skip those frames during playback.

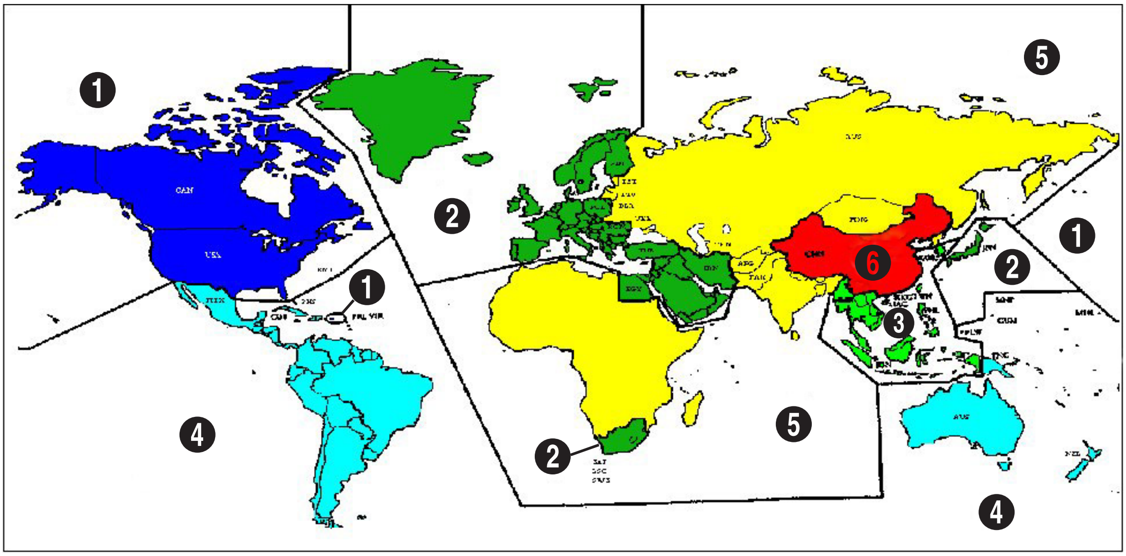
COPYRIGHT

Regional Code & Macrovision

- Classify the world into 6 regions, and if the DVD Title and the Player's "Reginal Code" do not agree, playback is prohibited.

- **Regionnal Coding is optional for the Soft developers (Region 0 All Code), but the Hardware developers must adopt the appropriate regionnal code for sale.**

  - Region 1 : The United States and its territories, Canada.
  - Region 2 : Europe, Japan, Greenland, Egypt, South Africa, the Middle East.
  - Region 3 : Taiwan, Hongkong, Korea, South East Asia.
  - Region 4 : Mexico, South America, Australia, New Zealand.
  - Region 5 : Russia, Eastern Europe, India, Africa.
  - Region 6 : China.
  - Region 0 : Worldwide (All Code)



- Adoptation of the Macrovision System disables the copying on to other media.

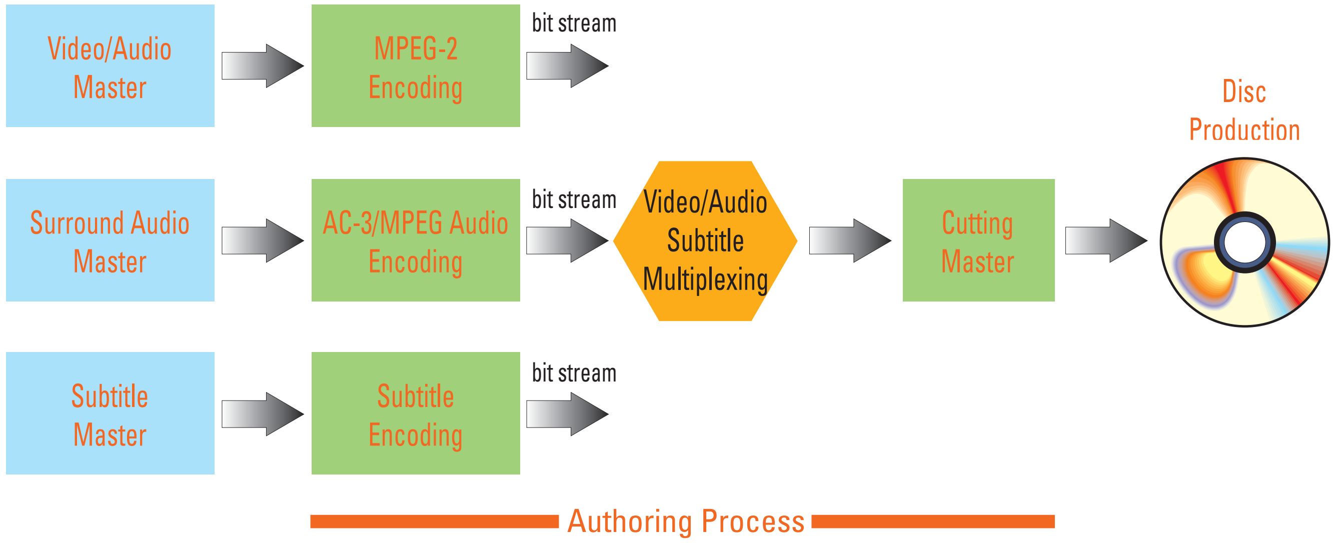
Remark

DVD-Video Authoring Process

- The image quality of the DVD-Video may vary accoring to the quality of the Master and the Authoring Process

  - The image quality of the DVD-Video varies according to the Digital Mastering Source such as the conventional LD, VCD, or Original Film.
  - Different Authoring Process are used accoring to the Software developers, and this may affect the DVD image quality.

- **Authoring Process**


Video/Audio Master
MPEG-2 Encoding
bit stream
Surround Audio Master
AC-3/MPEG Audio Encoding
bit stream
Subtitle Master
Subtitle Encoding
bit stream
Video/Audio Subtitle Multiplexing
Cutting Master
Disc Production
Authoring Process

14-3 About IEEE1394

14-3-1 Comparison between IEEE-1394 and other digital interfaces

Since there are many different interfaces available, for example, RS422, RS644, and USB, vision system integ rators are very likely to be confused when choosing the right interface for their application. For the ideal design of a vision system, it is vital to have the right bus/interface. To make things even more complex, there is no easy answer such as IEEE-1394 is the best choice.
Furthermore, the new CameraLink standard, promoted by companies such as Pulnix, Basler AG, and many frame grabber companies, seems to be the state of the art interface. So why should IEEE-1394 be an alternative?

These questions are as complex as mostvision applications and there is no simple guideline .
Each of these interfaces offers many benefits and each of them has its individual drawbacks and restrictions. In the table below, we try to give a brief comparison of the most popular interface systems.

	RS 644 [1]	**CameraLink**	**IEEE-1394**	**USB 2**
Topology	Link	Link	Bus	Bus
Windows Driver	Proprietary	Proprietary	Native (Win 200, Win 98)	Native (Win 200, Win 98)
“Guaranteed” Bandwidth	~20 to 40 MByte/s	~255 MBytes/s	~32 MBytes/s[2]	~38 MBytes/s[2]
Cable Length	~10 m @ 40MHz ~20 m @ 200MHz	~10 meters	4.5 meters	5 meters
Wires Needed for 8 Data Bits	22[3]	10	4	2
Parameter Port	No	≥ 1 KByte/s	~8 MBytes/s [2]	~9 MBytes/s [2]

[1] These specs are for a typical 8-bit camera application operating at 20 MHz or at 40 MHz.
[2] 80% of the bus bandwidth is used for image data and 20% is used for parameter data.
[3] 16 wires are used for data bit transfer and two wires each are used for the separate Line Valid, Frame Valid, and Pixel Clock signals required with RS-644 transmission.

A careful comparison of the specifications shown in the table should be your first sele ction guide for the interface. For example, for an integrator who needs very high speed, USB 2 and IEEE-1394 are not the first choice. On the other hand, these buses are the ones to select in cases
where multiple cameras are needed or cost is a critical issue. Also, the user needs to be aware
that the D-Cam specification currently does not specifically support Line Scan cameras.
However, the specification is open and line scan support could be achieved via Format 7. As
for USB 2, it is still in its infancy in machine vision and we are not aware of any kind of machine vision support.

14-3-2 Flexibility and Cost Reduction

Many image processing application engineers face a familiar group of problems when designing and building a system. The end user requires system flexibility, simple adaptation, fast delivery times, and most importantly a reasonable price. With conventional systems, whether analogor digital, engineers must confine them selves to certain combinations of the existing cameras, frame grabbers, and software. The product choice for this system configuration is limited. Unless the decision is made to use a high cost frame grabber that supports multiple cameras, sometimes known as multi-norm , it is usually not possible to operate cameras with different resolutions from the same frame grabber.

For many applications, the introduction of digital cameras is hindered by the cost specified by the end customer, however technically effective digital cameras may be. With the increased use of IEEE-1394 in the industrial image processing business, many of these problems are solvable in a sure , safe , and cost effective way.

1) Hardware Cost Example

This example compares two similar vision systems. Each system uses four Megapixel
resolution digital cameras . The traditional solution consists of one frame grabber per camera, one parallel digital data cable per camera, and one power supply per camera.
The 1394 solution requires one hub and one interface card to connect the four cameras , along
with five inexpensive 1394 cables. The 1394 cables carry power to the cameras directly from the computers internal power supply. (Note that not all computers are capable of supplying enough power for the cameras. In some cases a separate power supply may be required.)

Traditional Solution with multiple frame grabbers	Price	1394 Solution	Price
Four Cameras	18,000	Four 1394 Cameras	18,000
Four Frame Grabbers	4,400	One 1394 Interface Card	100
Four Cable	400	One 1394 Hub	120
Four power Supplies	320	Five Cables	150
Total	$23,120	Total	$18,370

14-3-3 Application Examples

Today, there are already applications realizing the benefits of IEEE-1394 technology. For example, at one of our customer sites, Basler was faced with a vision system which has the following specifications:
The machine is a high-speed assembly system . Two independent robots take different parts (different in size, shape, and reflection) from a support unit and mount these parts on a mounting plate. Timing is crucial, and in the worst case, a part must be taken from the tray every 100 ms. Accuracy of parts mounting is also critical (0.5 mm) . To have a vision system inspecting these operations , 4 cameras (2 on each of the robots) are needed:

- 2 low resolution Basler A302f cameras (640 x 480) for checking if the mounting plate is in place
- 2 high-resolution Basler A101f cameras (1300 x 1030) for checking the components to be mounted.

Since most of the parts are different, the two A101f cameras must be reconfigured before almost every image acquisition. In the worst case, the AOI, shutter, and sometimes gain need to be adjusted.

1) Solution used before Basler s Intervention

The customer used analog cameras with CCIR resolution (768 x 582) only. This drastically restricted the number of parts which could be mounted using the robots. Since these cameras had no communication port for configuration, adjusting the AOI was not possible and differences in reflection of the parts needed to be adjusted for by driving a flash circuit. All cameras were interfaced into one frame grabber (one PC).

2) Possible solution wih digial cameas using RS 644 OR Camera Link

Using RS 644 or CameraLink based cameras, the customer would need one frame grabber for each camera. It is very likely that the user would need two PCs (one for each robot). Changing the camera-configuration on the fly would require advanced grabber cards since simple grabbers are not capable of easily changing their registers for different AOIs.

3) IEEE-1394 solution

All cameras are attached to a single interface card in the PC. The Basler A302f is only used when a new mounting plate is positionedby the handler. In normal operation , only the two Basler A101f cameras will be sending data at the same time and they will be operating at about 10 FPS. This results in a data rate of about 27 MBytes/s, which is well within the specification for IEEE-1394.

Since IEEE-1394 supports bi-directional communication between the camera and the PC, before each frame capture , the PC can easily change resolution, gain , offset, shutter speed, or whatever is required.

The IEEE-1394 solution results in the seclear advantages for the customer:

- Onlyone PC,

- Only one interface card (very inexpensive compared with frame grabber cards),

- Easy and inexpensive cabling ,

- The system meets the expectations for speed and accuracy,

- The range of inspectable parts is much bigger than with the old system.

MEMO